

# **INJ. PUMP CALIBRATION DATA**

ENGINE MODEL 3AB1

BOSCH No. 9 400 610 091 1/4  
DKKC No. 101342 — 0250  
Date : 29, Sept. 1989  
Company : ISUZU  
No. 515600 9413

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101342 — 0250 2/4

Injection pump : PES3A Governor : EP/RSV Timing device :  
101034-9051 105410-3730

## **1. Test Conditions :**

Pump rotation : Counter clockwise viewed from drive side

Nozzle : 105780-0000 Nozzle Holder : 105780-2080  
(BOSCH Type No. DN12SD12T) (BOSCH Type No. EF8511/9A)  
Nozzle opening pressure : 175 kg/cm<sup>2</sup> Transfer pump pressure : 1.6 kg/cm<sup>2</sup>  
Injection pipe :  
Inner Dia. 2 mm x Outer Dia. 6 mm — Length 600 mm

Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. : 40 ± 5°C

Overflow valve opening pressure : — kg/cm<sup>2</sup>

## **2. Injection Timing :**

Pre-stroke : No. 1 Plunger 1.95 ± 0.05 mm

Note : Adjust with control rod position of mm

Injection order : 1 ~ 3 ~ 2 (interval : 120° ± 30°)

Plungers are numbered from the Drive side.

Tappet clearance : Bolt adjustment type ; More than 0.3 mm for all cylinders.  
Shim adjustment type ; Manually rotate the camshaft 2 ~ 3 times and confirm that it rotates smoothly.

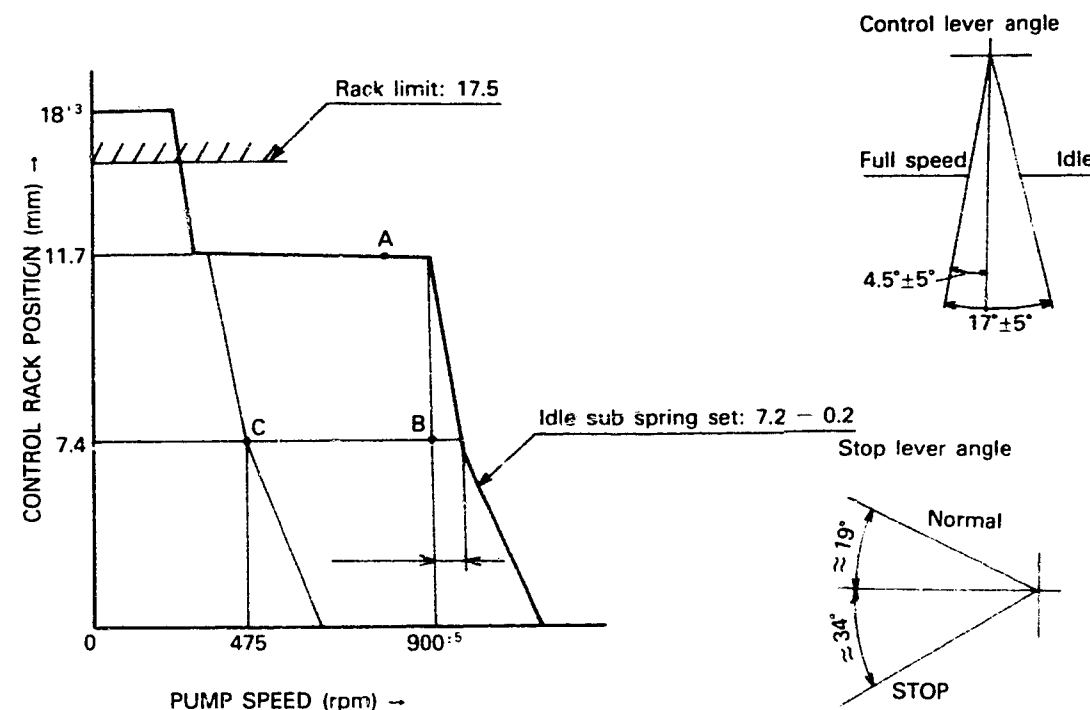
## **4. Injection Quantity :**

Adjusting Point	Rod Position (mm)	Pump Speed (r.p.m.)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
A	11.7	750	36.9 ~ 38.5	± 2	Rack	Basic
B	7.4	900	10.4 ~ 11.6	± 4	Rack	
C	Approx. 7.4	475	7 ~ 9	± 14	Rack	

## **5. Timing Advance Specification :**

Pump Speed (r.p.m.)							
Advance Angle (deg)	Start 0						

## **3. GOVERNOR ADJUSTMENT**



### **Note**

- Before adjustment, remove the idling sub spring and the torque control spring.
- Move the control lever fully in the stop direction, and set the minimum-speed stopper bolt so that the control rack position is 0.5 ~ 1.0 mm

### **Adjustment**

Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Full-load Adjustment (Temporary)	895 ~ 905	11.7	• Adjust using screw 1
	750	11.7	• Adjust using screw 2
Torque Control Spring Adjustment			• Adjust using spring capsule 1 • Confirm • Confirm • Confirm the torque control stroke is mm.



**DIESEL KIKI**

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Service Department

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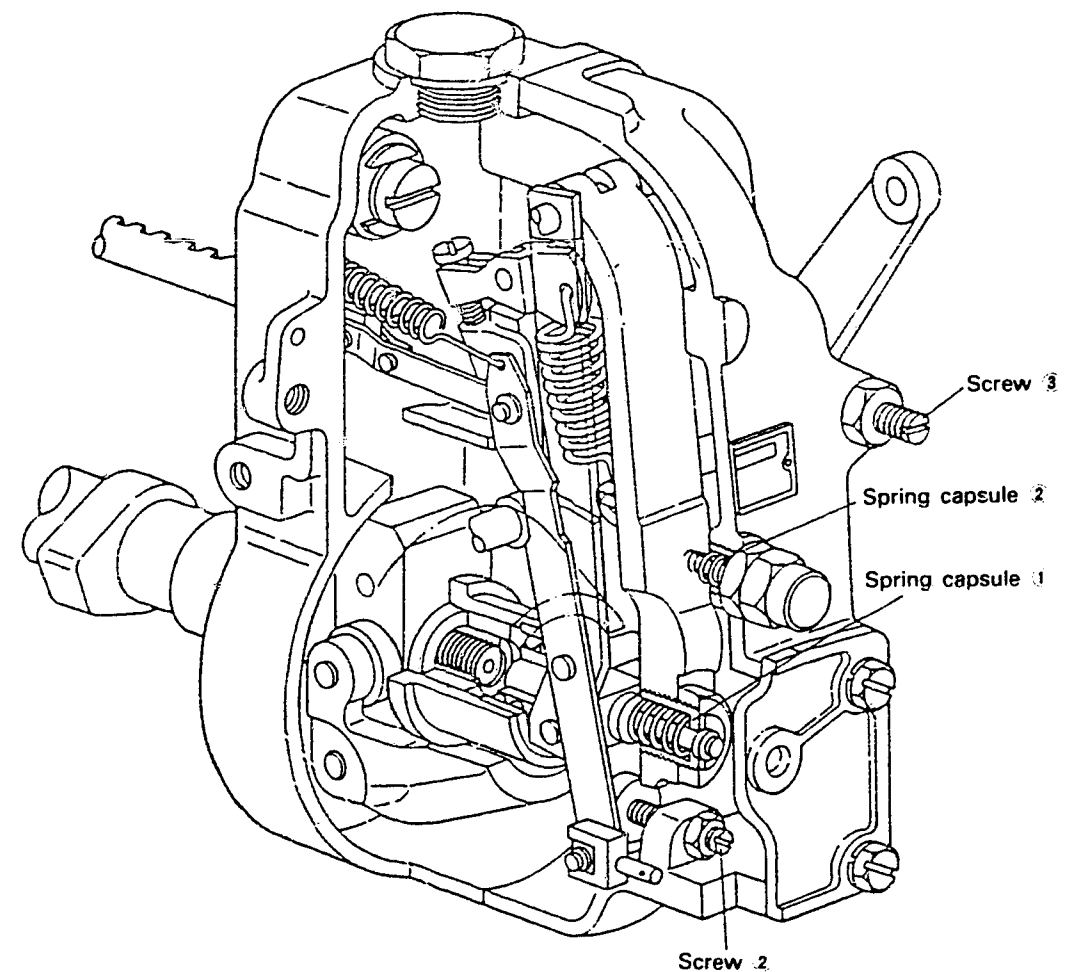
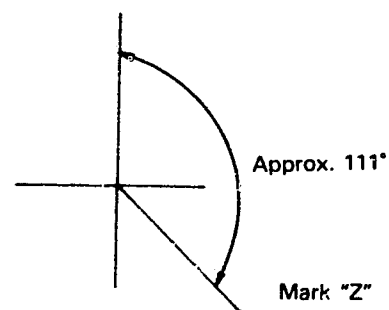
Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Idling Adjustment	475	7.4	<ul style="list-style-type: none"> <li>• Fix the control lever</li> <li>• Confirm</li> </ul>
Maximum-speed Adjustment	895 ~ 905	11.7	• Adjust using screw 1
	911 ~ 941	7.4	• Confirm speed droop
	—	7.0 ~ 7.2	• Adjust using spring capsule 2
	—	—	• Confirm
Full-load Adjustment (Install the cover on governor cover)	750	11.7	• Adjust using screw 3
Control Lever Angle Measurement	<ul style="list-style-type: none"> <li>• Measure the control lever angle at the "idling" and "full" positions.</li> <li>• When the control lever is depressed toward the "full" position, replace the shifter's shim with a thicker one.</li> <li>• When the control lever is depressed toward the "idling" position, replace the shifter's shim with a thinner one.</li> </ul>		
Rack Limiter Adjustment	0	17.5	• Adjust using screw

#### ■ Timing Setting

At No. 1 plunger's beginning of injection position.

B.T.D.C.: 18°

Pump center line



# INJ. PUMP CALIBRATION DATA

ENGINE MODEL C201PT

BOSCH No. 9 400 610 088 1/4  
 DKKC No. 101422 — 0081  
 Date : 29, Sept. 1989  
 Company : ISUZU  
 No. 515600 1977

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101422 — 0081 2/4

Injection pump : PES4A Governor : EP/RSV Timing device :  
 101042-9661 105410-1100

## 1. Test Conditions :

Pump rotation : Counter clockwiseviewed from drive side

Nozzle : 105780-0000 Nozzle Holder : 105780-2080  
 (BOSCH Type No. DN12SD12T) (BOSCH Type No. EF3511/9A)  
 Nozzle opening pressure : 175 kg/cm<sup>2</sup> Transfer pump pressure : 1.6 kg/cm<sup>2</sup>

Injection pipe :  
 Inner Dia. 2 mm x Outer Dia. 6 mm — Length 600 mm

Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. : 40±5°C

Overflow valve opening pressure : — kg/cm<sup>2</sup>

## 2. Injection Timing :

Pre-stroke : No. 1 Plunger 1.75 ± 0.05 mm

Note : Adjust with control rod position of mm

Injection order : 1 - 3 - 4 - 2 - 1 (interval : 90° ± 30°)

Plungers are numbered from the Drive side.

Tappet clearance : Bolt adjustment type : More than 0.3 mm for all cylinders.  
 : Shim adjustment type : Manually rotate the camshaft 2 ~ 3 times and confirm that it rotates smoothly.

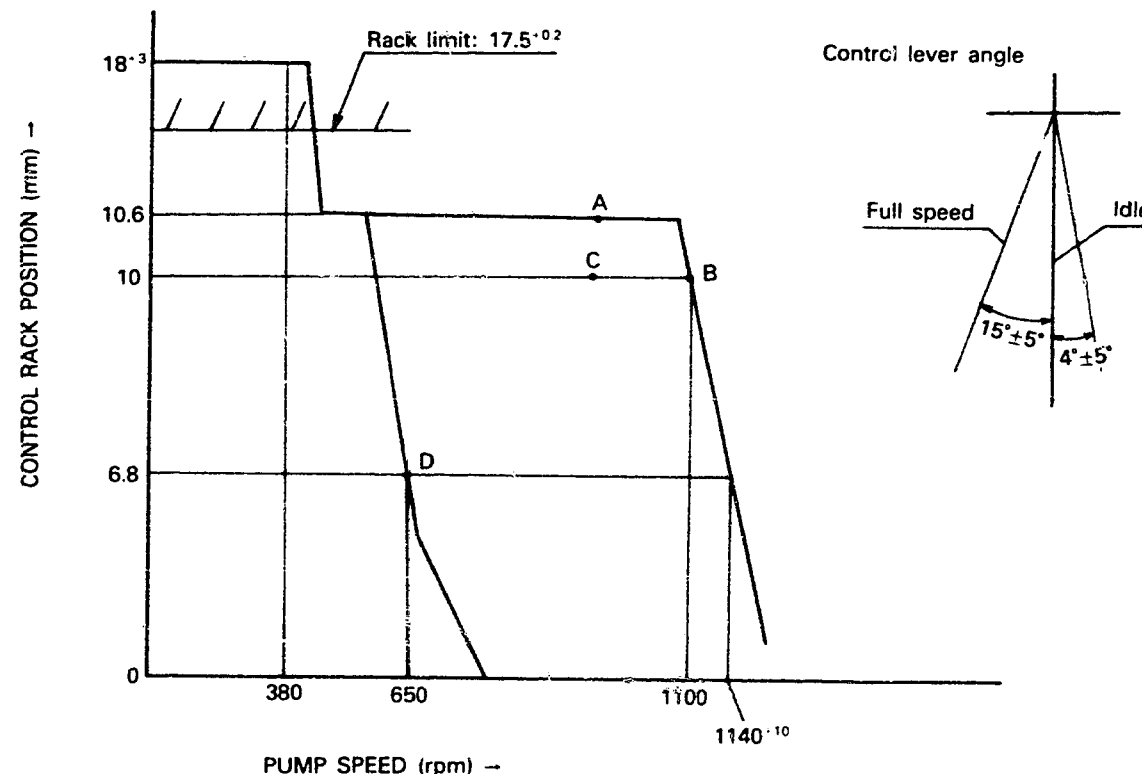
## 4. Injection Quantity :

Adjusting Point	Rod Position (mm)	Pump Speed (r.p.m.)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
B	10	1,100	23.0 ~ 24.2	± 2.5	Rack	Basic
D	6.8	650	5.4 ~ 7.6	± 14	Rack	

## 5. Timing Advance Specification :

Pump Speed (r.p.m.)							
Advance Angle (deg)	Start 0						

## 3. GOVERNOR ADJUSTMENT



### ■ Note

- Before adjustment, remove the idling sub spring and the torque control spring.
- Move the control lever fully in the stop direction, and set the minimum-speed stopper bolt so that the control rack position is 0.5 ~ 1.0 mm

### ■ Adjustment

Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Full-load Adjustment (Temporary)	1100	10	• Adjust using screw 1
	750	10.6	• Adjust using screw 2
Torque Control Spring Adjustment			• Adjust using spring capsule 1 • Confirm • Confirm • Confirm the torque control stroke is mm.

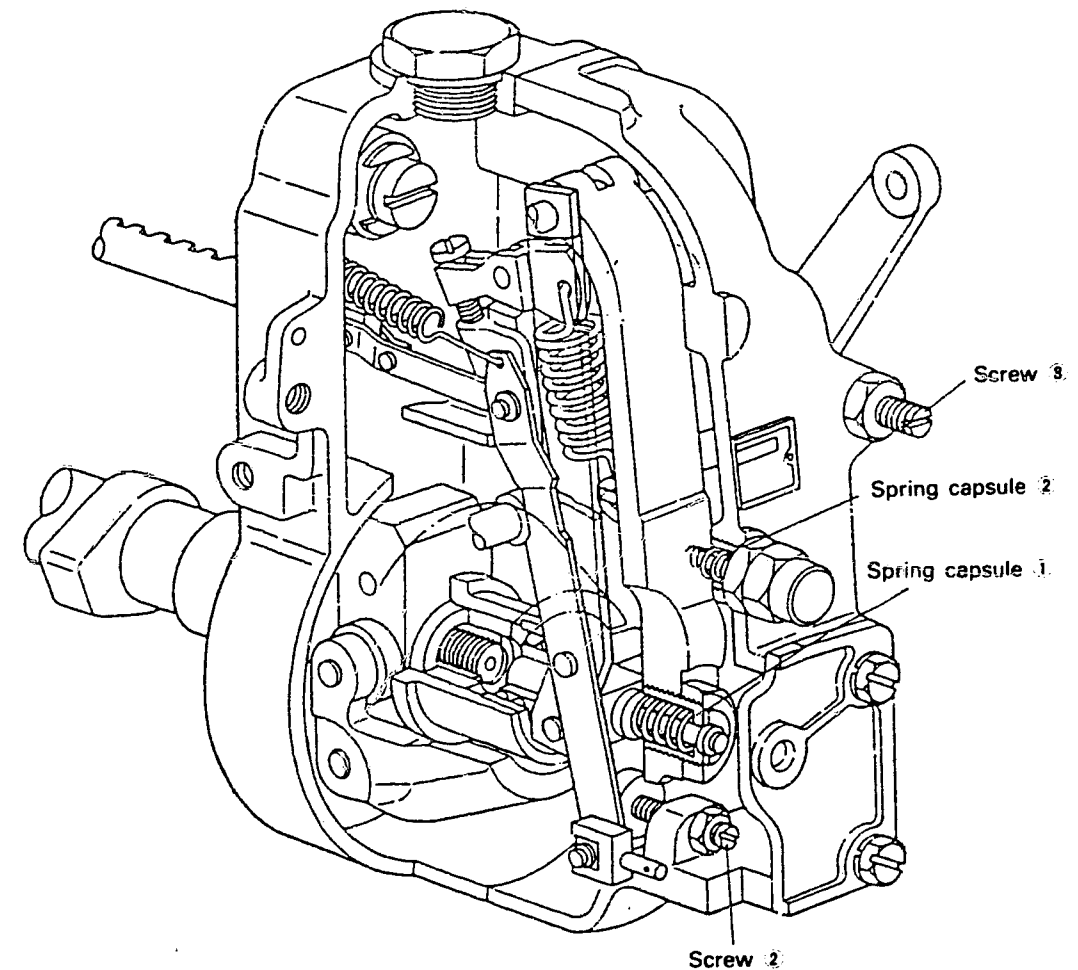


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Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Idling Adjustment	650 —	6.8 —	<ul style="list-style-type: none"> <li>• Fix the control lever</li> <li>• Confirm</li> </ul>
Maximum-speed Adjustment	1100 1140 ~ 1150 — — —	10 6.8 5.8 — —	<ul style="list-style-type: none"> <li>• Adjust using screw ①</li> <li>• Confirm speed droop</li> <li>• Adjust using spring capsule ②</li> <li>• Confirm</li> <li>• Confirm</li> </ul>
Full-load Adjustment (Install the cover on governor cover)	750	10.6	<ul style="list-style-type: none"> <li>• Adjust using screw ③</li> </ul>
Control Lever Angle Measurement	<ul style="list-style-type: none"> <li>• Measure the control lever angle at the "idling" and "full" positions.</li> <li>• When the control lever is depressed toward the "full" position, replace the shifter's shim with a thicker one.</li> <li>• When the control lever is depressed toward the "idling" position, replace the shifter's shim with a thinner one.</li> </ul>		
Rack Limiter Adjustment	0	17.5 <sup>+0.2</sup>	<ul style="list-style-type: none"> <li>• Adjust using screw</li> </ul>



# INJ. PUMP CALIBRATION DATA

ENGINE MODEL ED30

BOSCH No. 9 400 610 096 1/4  
DKKC No. 101451 — 9251  
Date : 29, Sept. 1989  
Company : NISSAN DIESEL  
No. 16700 J5577

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## 3. GOVERNOR ADJUSTMENT

(1) Pneumatic Governor

(2) Mechanical Governor

101451 — 9251 2/4

### 1. Test Conditions :

Pump rotation : clockwise-viewed from drive side

Nozzle : 105780-0000  
(BOSCH Type No. DN12SD12T)

Nozzle Holder : 105780-2080  
(BOSCH Type No. EF8511/9A)

Nozzle opening pressure : 175 kg/cm<sup>2</sup>

Transfer pump pressure : 1.6 kg/cm<sup>2</sup>

Injection pipe :

Inner Dia. 2 mm x Outer Dia. 6 mm — Length 600 mm

Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. : 40 ± 5°C

Overflow valve opening pressure : kg/cm<sup>2</sup>

### 2. Injection Timing :

Pre-stroke : No. 1 Plunger 2.15 ± 0.05 mm

Note : Adjust with control rod position of mm

Injection order : 1 - 3 - 4 - 2

(interval : 90° ± 30°)

Plungers are numbered from the Drive side.

Tappet clearance : Bolt adjustment type ; More than 0.3 mm for all cylinders.

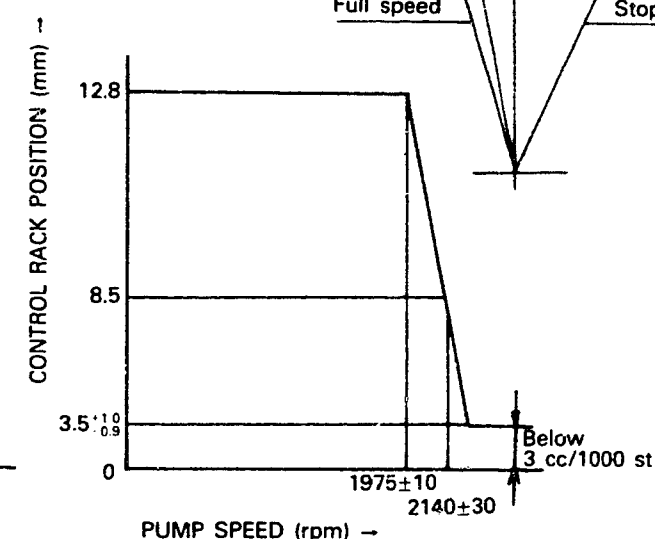
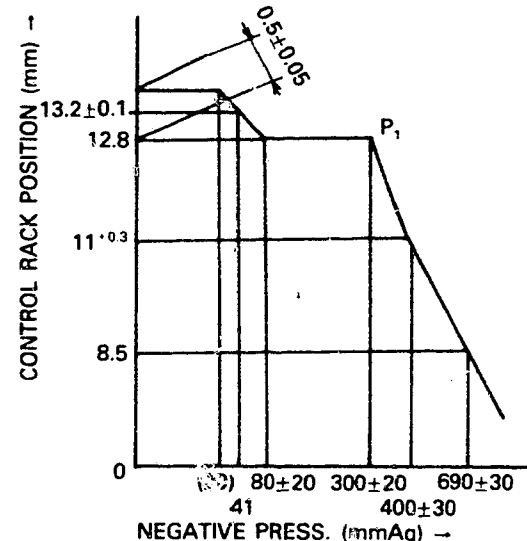
Shim adjustment type ; Manually rotate the camshaft 2 ~ 3 times and confirm that it rotates smoothly.

### 4. Injection Quantity :

Adjusting Point	Rod Position (mm)	Pump Speed (r.p.m.)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
	12.8	1,750	47.8 ~ 49.8	± 2.5	Rack	
	Approx. 9.4	300	12.7 ~ 17.3	± 15	Rack	

### 5. Timing Advance Specification :

Pump Speed (r.p.m.)	600	1,000	1,500	1,850			
Advance Angle (deg)	Below 0.5	1.3 ± 0.5	3.8 ± 0.5	5.7 ± 0.5			



#### Air Tightness Test

1. Increase the pressure of the pneumatic governor's negative pressure chamber to 320 mmAq at a pump speed of 320 rpm and a control rack position of Approx. 13.3 mm.
2. Then, confirm that it takes 10 seconds or more for the negative pressure to fall from 320 mmAq to 300 mmAq.

#### Adjustment

1. Pneumatic Governor (Pump Speed: 320 rpm)

Item	Negative Press. (mmAq)	Rack Position (mm)	Remarks
Smoke Set Screw Adjustment	0	13.3	• Adjust using spring capsule 1.
Torque Control Adjustment			
① Start of torque control spring movement	(120)	13.3	• Adjust thickness of shim 1.
② End of torque control spring movement	60 ~ 100	12.8	• Adjust thickness of shim 2.
③ Confirm	—	—	
④ Confirm torque control stroke	—	—	• Inspection: 0.5 ~ 0.7 mm



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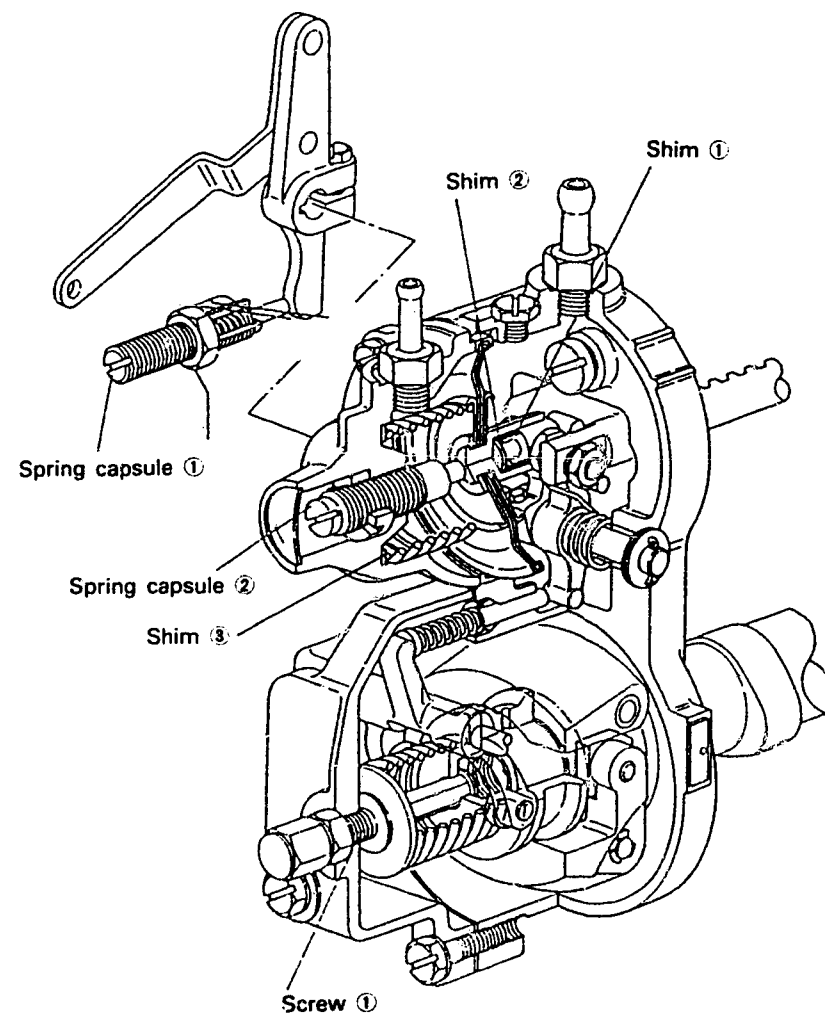
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Item	Negative Press. (mmAq)	Rack Position (mm)	Remarks
High-speed Control Adjustment	280 ~ 320	12.8	• Adjust thickness of shim ③.
Idling Adjustment	370 ~ 430 660 ~ 720	11.0 ~ 11.3 8.5	• Adjust using spring capsule ②. • Confirm

## 2. Mechanical Governor (Negative pressure: 280 ~ 320 mmAq)

Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Maximum Speed Control Adjustment	1965 ~ 1985 2110 ~ 2170 Approx. 2500	12.8 8.5 2.6 ~ 4.5	• Adjust using screw ①. • Confirm • Confirm (Check the fuel injection quantity: below 3 cc/1000st)



## Final Adjustment

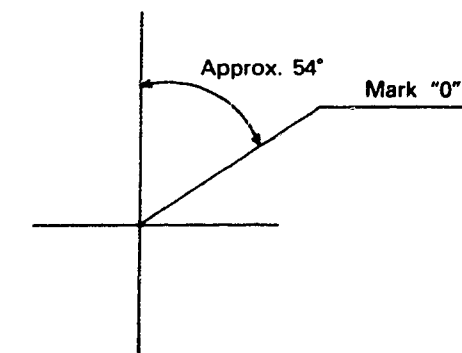
Smoke Setting			Fuel Injection Quantity Adjustment		
Pump Speed (rpm)	Negative Press. (mmAq)	Injection Q'ty (cc/1000st)	Pump Speed (rpm)	Negative Press. (mmAq)	Injection Q'ty (cc/1000st)
1750	12.8	48.3 ~ 49.3			

## Timing Setting

At No. 1 plunger's beginning of injection position.

B.T.D.C.: 14°

Pump center line



# INJ. PUMP CALIBRATION DATA

TEST OIL:  
ISO 4113 od  
SAE J967d

ENGINE MODEL : 6BD1-T

BOSCH No. 9 400 610 097 1/5  
DKKC No. 101602 — 4652  
Date : 29, Sept. 1989 [0]  
Company : ISUZU  
No. 115602 — 1061

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101602 — 4652 2/5

Injection pump : PE6A  
101060-2180

Governor : EP/RSV  
105411-1033

Timing device :

## 3. GOVERNOR ADJUSTMENT

### 1. Test Conditions :

Pump rotation : clockwise-viewed from drive side

Nozzle : 105780-0000

(BOSCH Type No. DN12SD12T)

Nozzle Holder : 105780-2080

(BOSCH Type No. EF8511/9A)

Nozzle opening pressure: 175 Kg/cm<sup>2</sup>

Transfer pump pressure : 1.6 kg/cm<sup>2</sup>

Injection pipe : Inner Dia. 2 mm x Outer Dia. 6 mm — Length 600 mm

Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. : 40<sup>±5</sup>°C

Overflow valve opening pressure : 1.3 Kg/cm<sup>2</sup>

### 2. Injection Timing :

Pre-stroke : No. 1 Plunger 3.4 ± 0.05 mm

Note : Adjust with control rod position of mm

Injection order : 1 ~ 5 ~ 3 ~ 6 ~ 2 ~ 4

(Interval : 60° ± 30')

Plunger are numbered from the Drive side.

Tappet clearance : Bolt adjustment type ; More than 0.3 mm with all cylinder.

: Shim adjustment type ; Manually rotate the camshaft 2 ~ 3 times and confirm that it rotates smoothly.

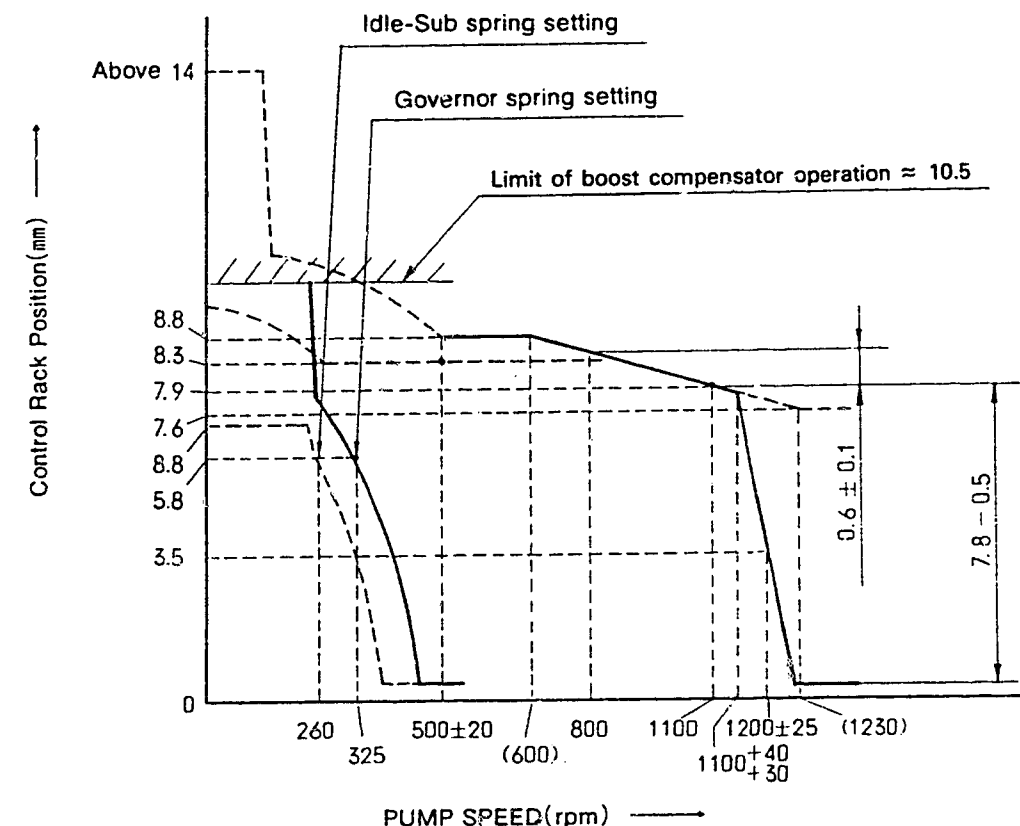
### 4. Injection Quantity :

Adjusting Point	Rod Position (mm)	Pump Speed (r.p.m.)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
A	7.9	1,100	69.3 ~ 72.3	± 2.5	Rod	Basic Boost press. Above 195 mmHg
H	Approx. 5.8	325	13.2 ~ 15.8	± 14	Rod	
A	7.9	1,100	69.3 ~ 72.3	± 2.5	Lever	
B	8.3	500	51.8 ~ 55.8	± 4	Lever	

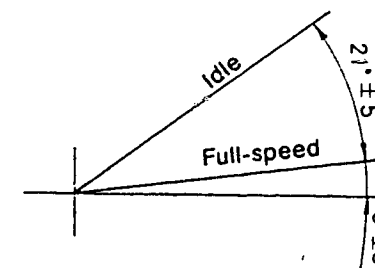
### 5. Timing Advance Specification :

Pump Speed (r.p.m.)							
Degree for Angle of Lead (deg.)							

Recommended speed droop adjustment screw position : 5  
(Notches from fully tightened position)



### SPEED CONTROL LEVER ANGLE



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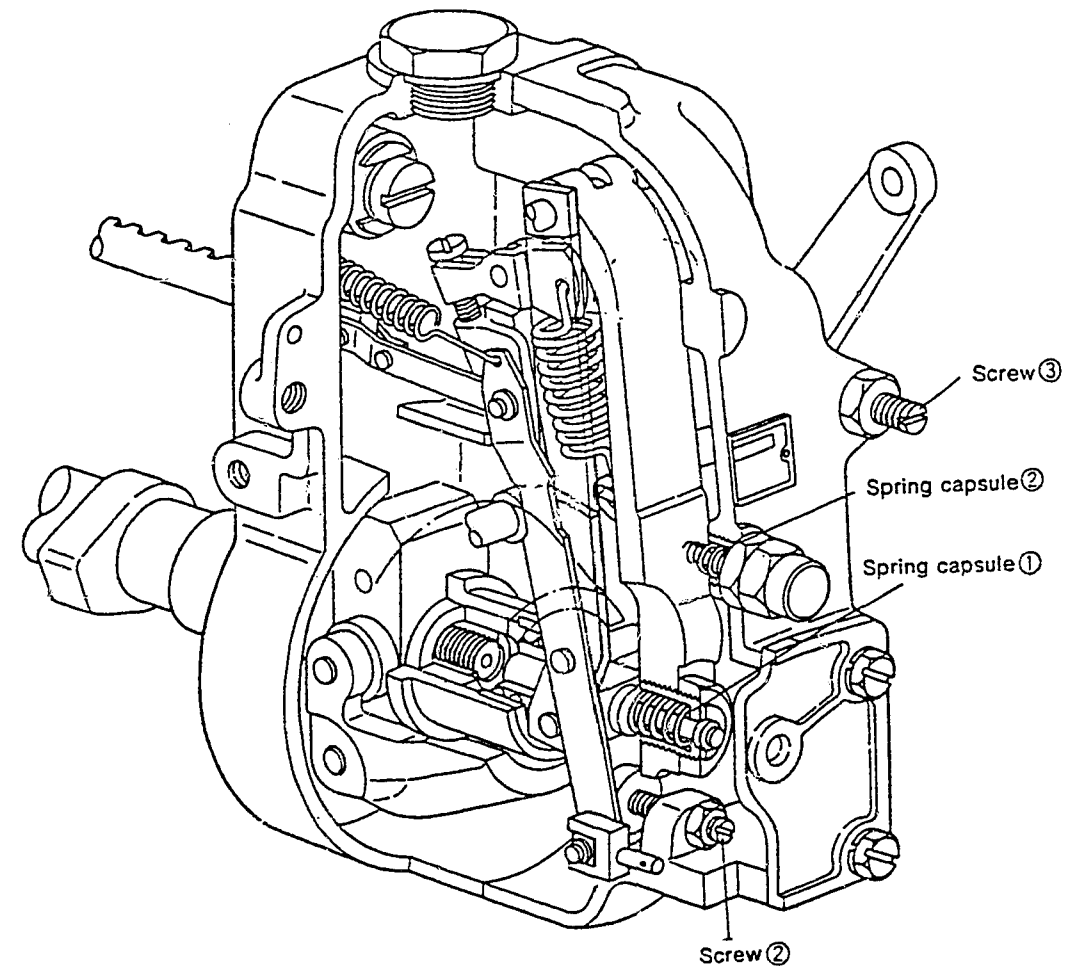
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## ■ Note

- Before adjustment, remove the boost compensator, the idling sub spring capsule and the torque control spring capsule.

## ■ Adjustment

Item	Pump speed (rpm)	Rack position (mm)	Remarks
Full-load adjustment (Temporary)	Above 1230	7.6	• Adjust using screw ①
	520	7.6	• Adjust using screw ②
Torque control spring adjustment	520	8.8	• Adjust using spring capsule ①
	Approx. 600	8.8	• Confirm
	1100	7.9	• Adjust using shim(s)
	Approx. 1230	7.6	• Confirm
	800 → 1100	—	• Confirm the torque control stroke is 0.5 ~ 0.7 mm
Idling adjustment	0	8.8	• Fix the control lever (Temporary)
	260	5.8	• Adjust using spring capsule ②
	325	5.8	• Adjust using screw ③
Maximum-speed adjustment	1175 ~ 1225	3.5	• Adjust using screw ①
	1130 ~ 1140	—	• Confirm the start of maximum-speed control
	Approx. 1250	0.1 ~ 0.6	• Confirm
Control lever angle measurement	<ul style="list-style-type: none"> <li>• Measure the control lever angle at the "idling" and "full" positions.</li> <li>• When the control lever is depressed toward the "full" position, replace the shifter's shim with a thicker one.</li> <li>• When the control lever is depressed toward the "idling" position, replace the shifter's shim with a thinner one.</li> </ul>		

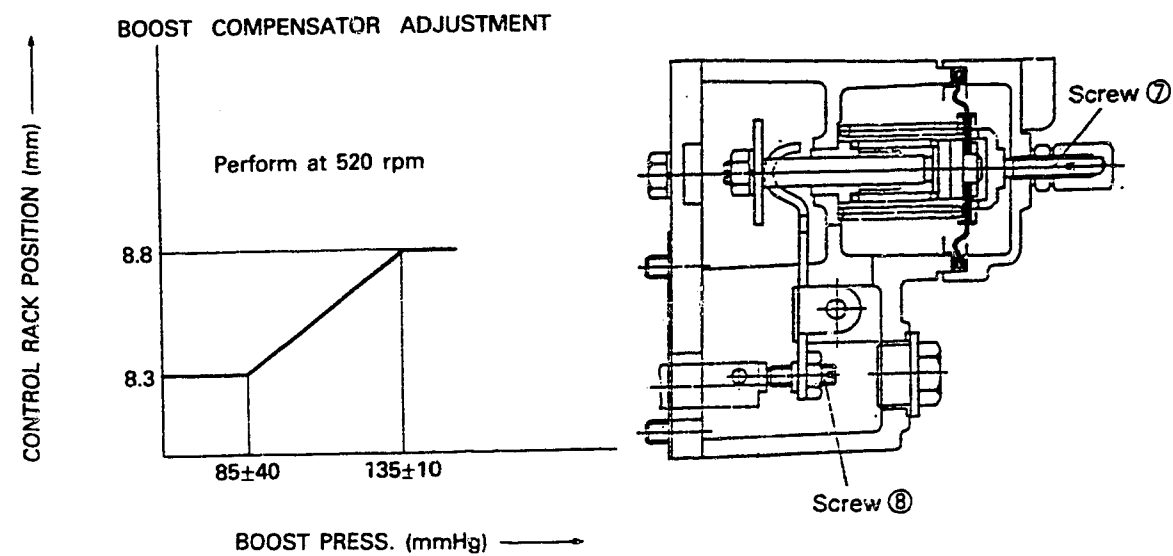




## ■ Boost compensator adjustment

- Maintain the pump speed at 520 rpm and fix the control lever in the full load position.

	Boost pressure (mmHg)	Rack position (mm)	Remarks
Boost compensator stroke adjustment	0	8.8 - 8.3	• Adjust using screw ⑧
Boost compensator spring adjustment	125 ~ 145 45 ~ 125	8.8 8.8	• Adjust using screw ⑦ • Confirm
Full-load adjustment (Perform at 1100 rpm)	Above 195	7.9	• Adjust using screw ①
Control rack limit (Perform at 0 rpm)	0	Approx. 10.5	• Confirm



# **INJ. PUMP CALIBRATION DATA**

ENGINE MODEL 6D16

BOSCH No. 9 400 610 093 1/5  
DKKC No. 101603 — 6011  
Date : 29, Sept. 1989 7  
Company : MITSUBISHI  
No. ME046100

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## **3. GOVERNOR ADJUSTMENT**

Full-load adjustment

Torque cam No.: "B07"

101603 — 6011 2/5

## **1. Test Conditions :**

Pump rotation : Counter clockwiseviewed from drive side

Nozzle : 105780-0000  
(BOSCH Type No. DN12SD12T)

Nozzle Helder : 105780-2080  
(BOSCH Type No. EF8511/9A)

Nozzle opening pressure : 175 kg/cm<sup>2</sup>

Transfer pump pressure : 1.6 kg/cm<sup>2</sup>

Injection pipe :

Inner Dia. 2 mm x Outer Dia. 6 mm — Length 600 mm

Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d)

Oil Temp. : 40<sup>±</sup>5°C

Overflow valve opening pressure : 1.6 kg/cm<sup>2</sup>

## **2. Injection Timing :**

Pre-stroke : No. 1 Plunger 3.3 ± 0.05 mm

Note : Adjust with control rod position of mm

Injection order : 1 ~ 5 ~ 3 ~ 6 ~ 2 ~ 4

(interval : 60° ± 30')

Plungers are numbered from the Governor side.

Tappet clearance : Bolt adjustment type ; More than 0.3 mm for all cylinders.

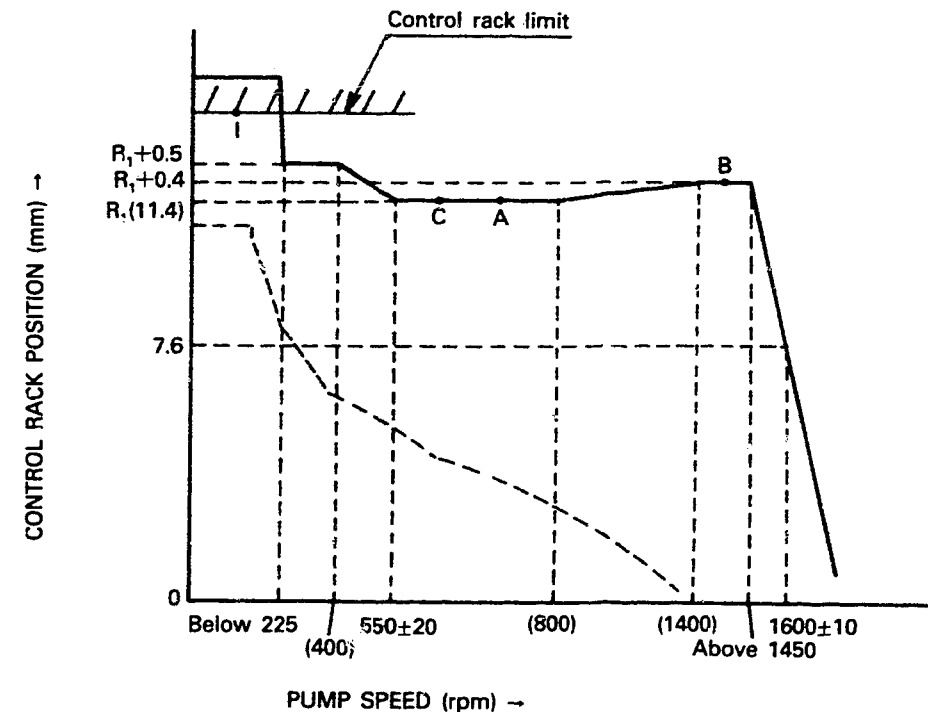
: Shim adjustment type ; Manually rotate the camshaft 2 ~ 3 times and confirm that it rotates smoothly.

## **4. Injection Quantity :**

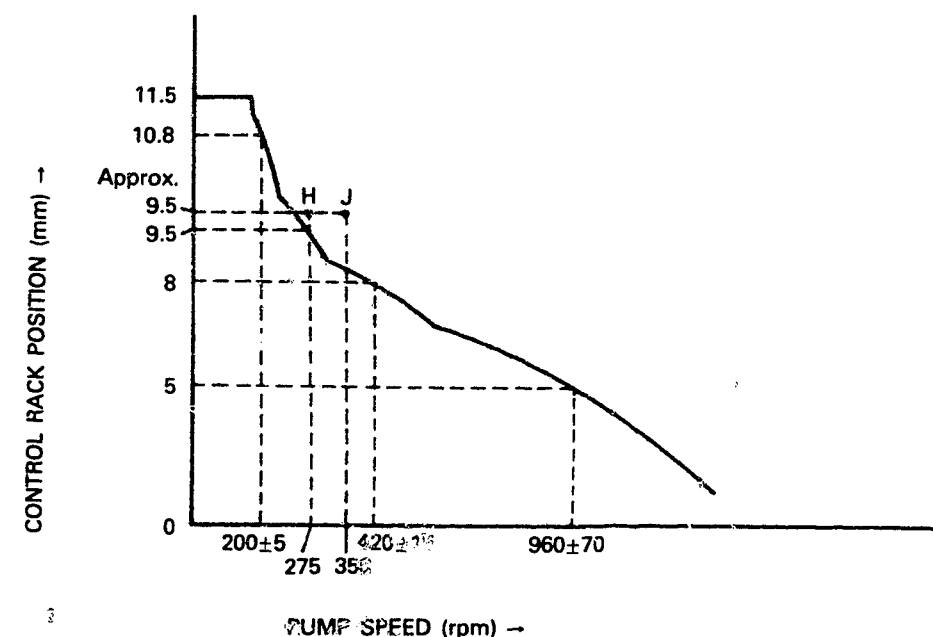
Adjusting Point	Rod Position (mm)	Pump Speed (r.p.m.)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
	11.4	900	52.0 ~ 57.0	—	Rack	Basic Each cylinder
D	Approx. 8.7	500	5.9 ~ 9.3	—	Rack	
A	R <sub>1</sub> (11.4)	700	53.5 ~ 55.5	—	Lever	Basic
B	R <sub>1</sub> + 0.4	1,450	(77.8 ~ 81.8)	—	Lever	
C	R <sub>1</sub> (11.4)	600	(46.5 ~ 50.5)	—	Lever	
I	(14.3)	100	63.0 ~ 83.0	—	Lever	Control rack limit
H	Approx. 9.5	275	7.0 ~ 10.4	—	Rack	Confirmation

## **5. Timing Advance Specification :**

Pump Speed (r.p.m.)	Below 900	850	1,200	1,500			
Advance Angle (deg)	Start	Below 0.5	2.2 ~ 3.2	Finish 4.5 ~ 5.5			

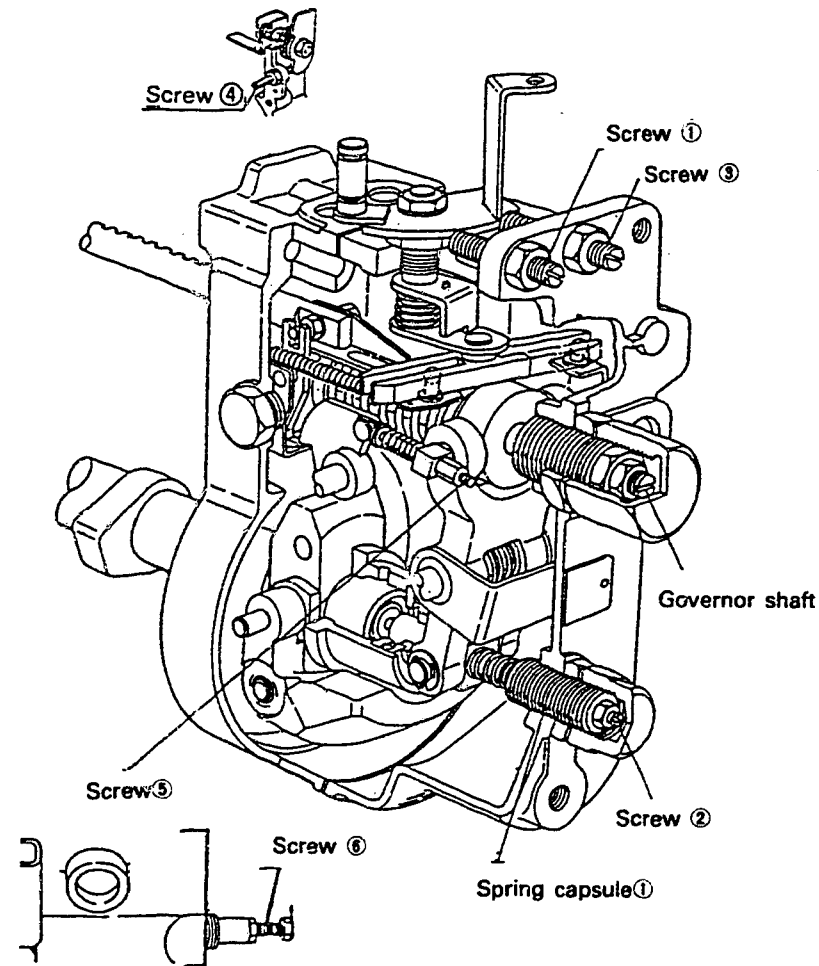


Idling adjustment



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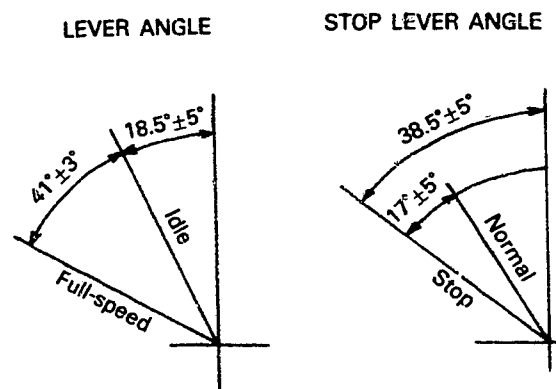
#### ■ Idling Adjustment

Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Idling Lever Position: Temporary Setting	80 ~ 100	11.5	• Adjust using screw ①
Idling Position Setting	195 ~ 205	10.8	• Adjust using spring capsule ①.
	275	9.5	• Adjust shim ① inside the spring capsule.
Governor Spring Contact Adjustment	405 ~ 435	8	• Adjust the governor shaft position.
	890 ~ 1030	5	• Confirm
Setting the Idling Lever Position	275	Approx. 9.5	• Adjust using screw ①.
	—	—	• Confirm the control lever angle (13.5° ~ 23.5°)

#### ■ Full Load Adjustment (Torque Cam No. B07)

Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Full Speed Lever Position: Temporary Setting	Above 1450	$R_1 + 0.4$	• Adjust using screw ③. (Do not enter governor control range)
Full Load Position Adjustment	700	(11.4)	• Adjust using screw ④.
Torque Cam Position Adjustment	(400)	$R_1 + 0.5$	• Adjust using screw ⑤.
	700	$R_1$ (11.4)	• Confirm • Confirm • Confirm • Confirm • Confirm • Confirm • Confirm • Confirm
Confirm injection quantity at pints A to C.			
Maximum Speed control Adjustment	Above 1450	$R_1 + 0.4$	• Adjust using screw ③.
	1590 ~ 1610	7.6	• Confirm
	—	—	• After adjustment, confirm that the control lever angle is 38° ~ 44°.
Confirming Excess Fuel Limit for Engine Starting	350	Approx. 9.5	• Set the control lever at point J.
	0	11.5	• Confirm • Move the control lever to the "full-speed" position and then confirm the control rack position.
Confirm the Black Smoke Limit	Fix the control lever at point H. Then, operate the pump at (275) rpm. Confirm that the control rack does not move beyond $R_1$ (11.5) mm. When the control lever is moved to the "full-speed" position again increase the pump speed and confirm that the control rack starts to move from a pump speed of                  rpm.		
Rack Limiter Adjustment	100	(14.3)	• Fix the control rack using screw.
	Measure the depth of the control rack cap. Then, adjust screw ⑥ so that it equals the depth of the rack cap and install the rack cap. Confirm injection quantity at point I.		

- Timing Setting  
At No. 1 plunger's beginning of injection position.  
B.T.D.C.: 16°



# INJ. PUMP CALIBRATION DATA

ENGINE MODEL 6D31

BOSCH No. 9 400 610 095 1/4  
 DKKC No. 101606 — 1572  
 Date : 29, Sept. 1989 [E]  
 Company : MITSUBISHI  
 No. ME086553

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## 3. GOVERNOR ADJUSTMENT

101606 — 1572 2/4

Injection pump : PES6A Governor : EP/RLD-A Timing device : EP/SA  
 101061-9131 105921-2590 105614-0772

### 1. Test Conditions :

Pump rotation : Clockwise viewed from drive side

Nozzle : 105780-0000 Nozzle Holder : 105780-2080  
 (BOSCH Type No. DN12SD12T) (BOSCH Type No. EF8511/9A)  
 Nozzle opening pressure : 175 kg/cm<sup>2</sup> Transfer pump pressure : 1.6 kg/cm<sup>2</sup>  
 Injection pipe : Inner Dia. 2 mm x Outer Dia. 6 mm — Length 600 mm

Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. : 40 ± 5°C

Overflow valve opening pressure : 1.95 kg/cm<sup>2</sup>

### 2. Injection Timing :

Pre-stroke : No. 1 Plunger 3.6 ± 0.05 mm

Note : Adjust with control rod position of mm

Injection order : 1 ~ 5 ~ 3 ~ 6 ~ 2 ~ 4 (interval: 60° ± 30')

Plungers are numbered from the Drive side.

Tappet clearance : Bolt adjustment type ; More than 0.3 mm for all cylinders.  
 ; Shim adjustment type ; Manually rotate the camshaft 2 ~ 3 times and confirm that it rotates smoothly.

### 4. Injection Quantity :

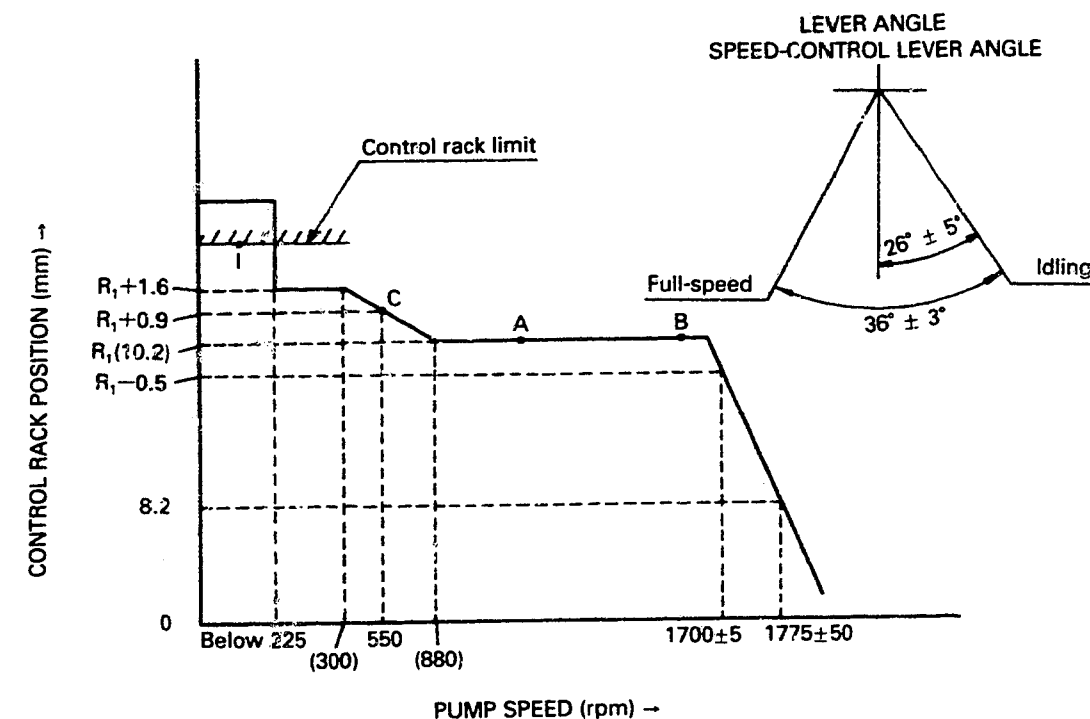
Adjusting Point	Rod Position (mm)	Pump Speed (r.p.m.)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
	10.2	1,000	43.7 ~ 46.9	± 2.5	Rack	Basic
H	Approx. 9.5	275	9.7 ~ 12.3	± 10	Rack	
A	R <sub>1</sub> (10.2)	1,000	44.3 ~ 46.3	—	Lever	Basic
B	R <sub>1</sub> (10.2)	1,600	(46.2 ~ 50.2)	—	Lever	
C	R <sub>1</sub> + 0.9	550	(42.7 ~ 46.7)	—	Lever	
I	—	100	61.0 ~ 71.0	—	Lever	Control rack limit

### 5. Timing Advance Specification :

Pump Speed (r.p.m.)	Below 1,400	1,350	1,600				
Advance Angle (deg)	Start	Below 0.5	Finish 3.0 ~ 4.0				

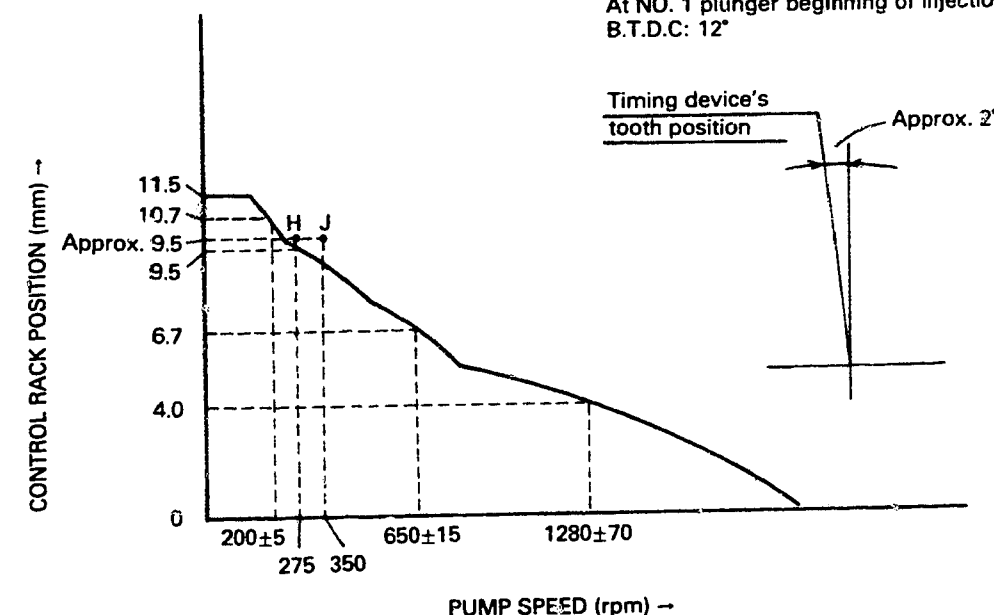
### FULL LOAD ADJUSTMENT

Torque cam NO.: "C77"

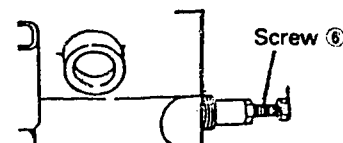


### IDLING ADJUSTMENT

TIMING SETTING  
 At NO. 1 plunger beginning of injection  
 B.T.D.C: 12°



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 Service Department Tel. (03)5485-4135 · Fax: (03)493-4115



### ■ Idling Adjustment

Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Idling Lever Position: Temporary Setting	80 ~ 100	11.5	• Adjust using screw ①.
Idling Position Setting	195 ~ 205 275	10.7 9.5	• Adjust using spring capsule ①. • Adjust shim ① inside the spring capsule.
Governor Spring Contact Adjustment	635 ~ 665 1210 ~ 1350	6.7 4.0	• Adjust the governor shaft position. • Confirm
Setting the Idling Lever Position	350 —	Approx. 9.5 —	• Adjust using screw ①. • Confirm the control lever angle (21° ~ 31°)

### ■ Full Load Adjustment (Torque Cam No. C77)

Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Full Speed Lever Position: Temporary Setting	1600	$R_1$ (10.2)	<ul style="list-style-type: none"> <li>Adjust using screw ③.</li> <li>(Do not enter governor control range)</li> </ul>
Full Load Position Adjustment	1000	10.2	<ul style="list-style-type: none"> <li>Adjust using screw ④.</li> </ul>
Torque Cam Position Adjustment	(500) (300) (880)	$R_1 + 0.9$ $R_1 + 1.6$ $R_1$ (10.2)	<ul style="list-style-type: none"> <li>Adjust using screw ⑤.</li> <li>Confirm</li> <li>Confirm</li> <li>Confirm</li> <li>Confirm</li> <li>Confirm</li> <li>Confirm</li> <li>Confirm</li> </ul>
Confirm injection quantity at pints A to C.			
Maximum Speed control Adjustment	1695 ~ 1705 1725 ~ 1825 —	$R_1 - 0.5$ 8.2 —	<ul style="list-style-type: none"> <li>Adjust using screw ③.</li> <li>Confirm</li> <li>After adjustment, confirm that the control lever angle is <math>33^\circ \sim 39^\circ</math>.</li> </ul>
Confirming Excess Fuel Limit for Engine Starting	350 0	Approx. 9.5 11.5	<ul style="list-style-type: none"> <li>Set the control lever at point J.</li> <li>Confirm</li> <li>Move the control lever to the "full-speed" position and then confirm the control rack position.</li> </ul>
Confirm the Black Smoke Limit	Fix the control lever at point H. Then, operate the pump at (275) rpm. Confirm that the control rack does not move beyond $R_1$ (11.5) mm. When the control lever is moved to the "full-speed" position again increase the pump speed and confirm that the control rack starts to move from a pump speed of below 325 rpm.		
Rack Limiter Adjustment	100	61.0 ~ 71.0 (cc/1000st)	<ul style="list-style-type: none"> <li>Fix the control rack using screw.</li> </ul>
Measure the depth of the control rack cap. Then, adjust screw ⑥ so that it equals the depth of the rack cap and install the rack cap. Confirm injection quantity at point I.			

# **INJ. PUMP CALIBRATION DATA**

ENGINE MODEL DS50

BOSCH No. 9 400 610 098 1/4  
DKKC No. 101672 — 2492  
Date : 29, Sept. 1989  
Company : HINO  
No. 22020 2380A

**B - 15**

101672 — 2492 2/4

Injection pump : PE6A Governor : EP/RSV Timing device :  
101067-0591 105400-1430

## **1. Test Conditions :**

Pump rotation : clockwise-viewed from drive side

Nozzle : 105780-0000 Nozzle Holder : 105780-2080  
(BOSCH Type No. DN12SD12T) (BOSCH Type No. EF8511/9A)  
Nozzle opening pressure : 175 kg/cm<sup>2</sup> Transfer pump pressure : 1.6 kg/cm<sup>2</sup>  
Injection pipe :  
Inner Dia. 2 mm x Outer Dia. 6 mm — Length 600 mm

Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. : 40<sup>±5</sup>°C

Overflow valve opening pressure : — kg/cm<sup>2</sup>

## **2. Injection Timing :**

Pre-stroke : No. 1 Plunger 2.1 ± 0.05 mm

Note : Adjust with control rod position of mm

Injection order : 1 ~ 4 ~ 2 ~ 6 ~ 3 ~ 5 (interval : 60° ± 30°)

Plungers are numbered from the Drive side.

Tappet clearance : Bolt adjustment type ; More than 0.3 mm for all cylinders.  
Shim adjustment type ; Manually rotate the camshaft 2 ~ 3 times and confirm that it rotates smoothly.

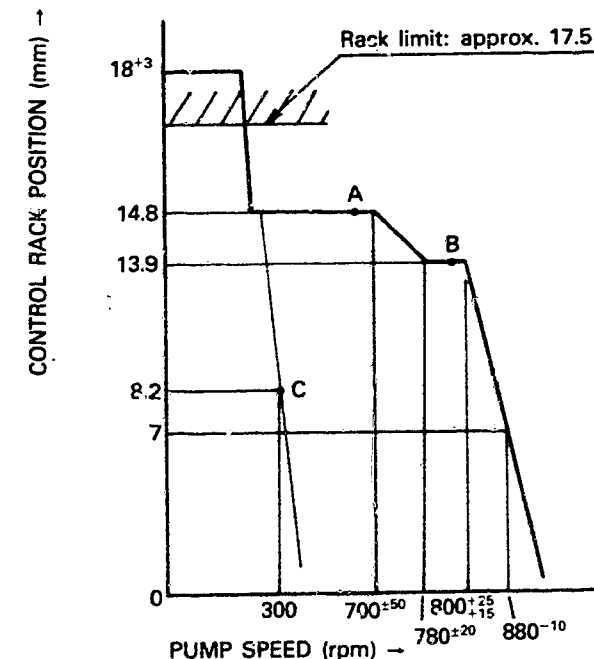
## **4. Injection Quantity :**

Adjust- ing Point	Rod Position (mm)	Pump Speed (r.p.m.)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
A	14.8	600	91.2 ~ 94.8	± 2	Lever	Basic
B	13.9	800	86.8 ~ 91.2	± 3	Rack	
C	Approx. 8.2	300	15.4 ~ 20.6	± 13	Rack	

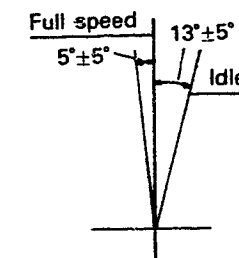
## **5. Timing Advance Specification :**

Pump Speed (r.p.m.)						
Advance Angle (deg)	Start 0					

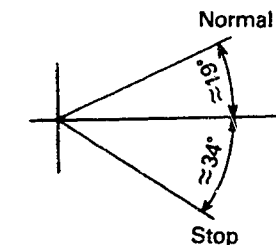
## **3. GOVERNOR ADJUSTMENT**



Control lever angle



Stop lever angle



### **Note**

- Before adjustment, remove the idling sub spring and the torque control spring.
- Move the control lever fully in the stop direction, and set the minimum-speed stopper bolt so that the control rack position is 0.5 ~ 1.0 mm

### **Adjustment**

Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Full-load Adjustment (Temporary)	815 ~ 825	13.9	• Adjust using screw ①
	800	13.9	• Adjust using screw ②
Torque Control Spring Adjustment	600	14.8	• Adjust using spring capsule ①
	650 ~ 750	14.8	• Confirm
	760 ~ 800	13.9	• Confirm • Confirm the torque control stroke is 0.9 mm.



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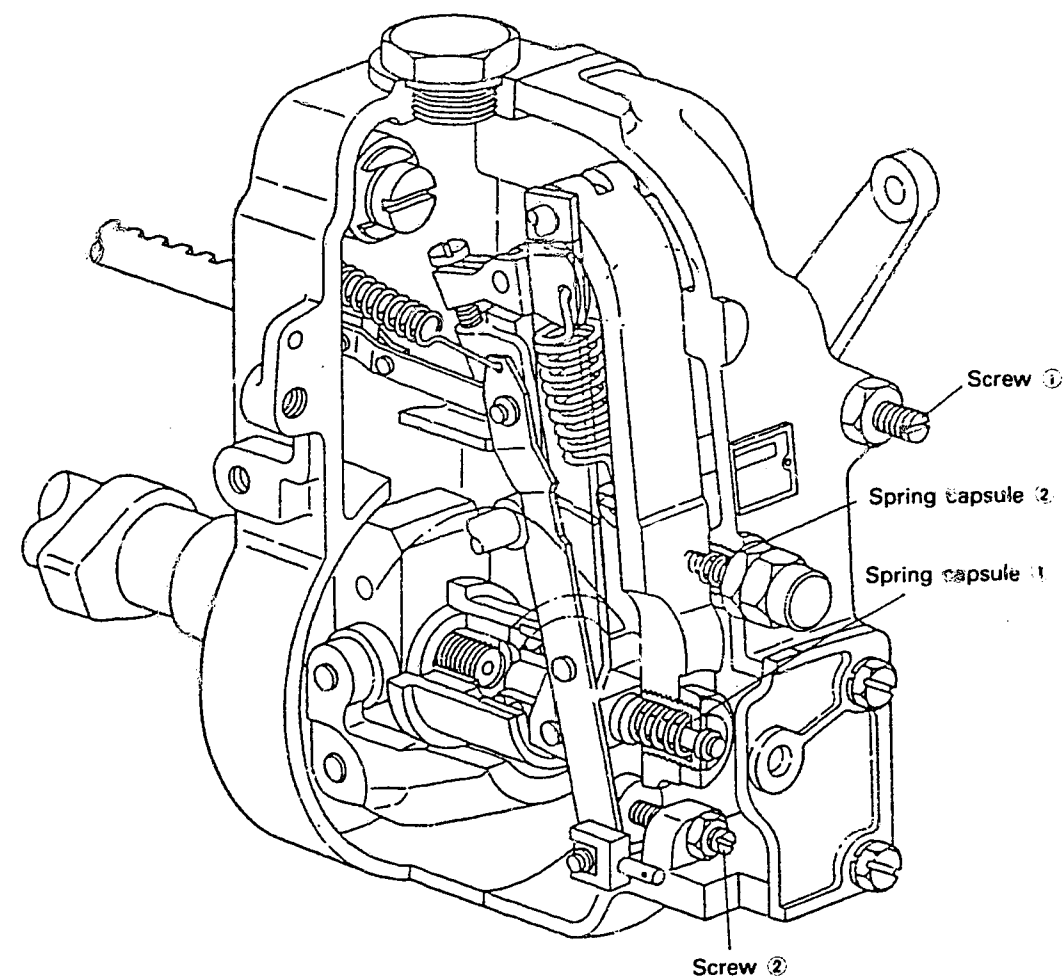
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Tel. (03)5485-4135 · Fax: (03)499-4115

Item	Pump Speed (rpm)	Rack Position (mm)	Remarks
Idling Adjustment	300 —	8.2 —	<ul style="list-style-type: none"> <li>• Fix the control lever</li> <li>• Confirm</li> </ul>
Maximum-speed Adjustment	815 ~ 825 870 ~ 880 — —	13.9 7.0 — —	<ul style="list-style-type: none"> <li>• Adjust using screw ①</li> <li>• Confirm speed droop</li> <li>• Adjust using spring capsule</li> <li>• Confirm</li> <li>• Confirm</li> </ul>
Full-load Adjustment (Install the cover on governor cover)	800	13.9	<ul style="list-style-type: none"> <li>• Adjust using screw ②</li> </ul>
Control Lever Angle Measurement	<ul style="list-style-type: none"> <li>• Measure the control lever angle at the "idling" and "full" positions.</li> <li>• When the control lever is depressed toward the "full" position, replace the shifter's shim with a thicker one.</li> <li>• When the control lever is depressed toward the "idling" position, replace the shifter's shim with a thinner one.</li> </ul>		
Rack Limiter Adjustment	0	17.5	<ul style="list-style-type: none"> <li>• Adjust using screw</li> </ul>





# INJ. PUMP CALIBRATION DATA

ENGINE MODEL GD320, GD410

BOSCH No. 9 443 610 061  
DKKC No. 104135 — 1000  
Date: 29, Sept. 1989 [0]  
Company: HONDA  
No. 16300-ZG3-003

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INJ. Pump Ass'y No. 104135 — 1000 (NP — PFR1KX60/1NP1)

## 1. Test Conditions :

Nozzle & Nozzle Holder Ass'y No. : 105780 — 8140  
Nozzle No. : 105780 — 0000 (Bosch Type No. DN12SD12T)  
Nozzle Holder No. : 105780 — 2080  
Nozzle Opening Press. :  $120^{+5}$  Kg/cm<sup>2</sup>      Transfer Pump Press. : 0.5 Kg/cm<sup>2</sup>  
Injection Pipe No. : 157635 — 3320  
Inner Dia. 2 mm × Outer Dia. 6 mm — Length 600 mm  
Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d)    Oil Temp. :  $35^{+10}$  °C  
Cam Profile : PFK — T — 00      (Tangential Cam , Cam Lift 7 mm , Base Circle  $\phi$  28)

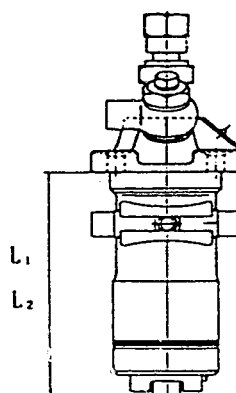
## 2. Injection Timing :

PRE-STROKE :  $3.2 \pm 0.05$  mm(\*)

L<sub>1</sub> (Port Closing Dimension) :  $72.8 \pm 0.05$  mm

L<sub>2</sub> (Mounting Dimension) :  $76.0 \pm 0.05$  mm

(\*) The control rack is pushed fully in the fuel increase direction.



## 3. Injection Quantity :

Rod Position (mm)	Pump Speed (r.p.m)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
$10.7 \pm 1.0$	1800	24.5 ~ 25.5		Rod	Basic

## 4. Control Rod Sliding Resistance :

Pump Speed (r.p.m)	Sliding Resistance (g)
0	Below 50
200	Below 30
1,000	Below 20



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# INJ. PUMP CALIBRATION DATA

ENGINE MODEL N843, J843, J823

BOSCH No. 9 443 610 070  
DKKC No. 104294 — 3120  
Date: 29, Sept. 1989  
Company: ISHKAWAJIMA  
No. 13101 7360

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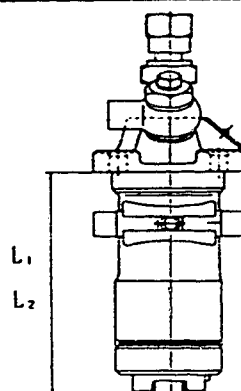
INJ. Pump Ass'y No. 104294 — 3120 (NP — PFR3KD55/2NP18)

## 1. Test Conditions :

Nozzle & Nozzle Holder Ass'y No. : 105780 — 8140  
Nozzle No. : 105780 — 0000 (Bosch Type No. DN12SD12T)  
Nozzle Holder No. : 105780 — 2080 (Bosch Type No. EF8511/9A)  
Nozzle Opening Press. :  $120^{+5}$  Kg/cm<sup>2</sup>      Transfer Pump Press. : 0.5 Kg/cm<sup>2</sup>  
Injection Pipe No. : 157805 — 3320  
Inner Dia. 2 mm × Outer Dia. 6 mm — Length 600 mm  
Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. :  $35^{+10}$  °C  
Cam Profile : PFK — T 00 (Tangential Cam, Cam Lift 7 mm, Base Circle  $\phi$  28)

## 2. Injection Timing :

PRE-STROKE :  $2.45 \pm 0.05$  mm  
 $L_1$  (Port Closing Dimension) :  $73.55 \pm 0.05$  mm  
 $L_2$  (Mounting Dimension) :  $76.0 \pm 0.05$  mm



## 3. Injection Quantity :

Rod Position (mm)	Pump Speed (r.p.m)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
a	1,300	21.3 ~ 21.7	—	Rod	Basic

## 4. Control Rod Sliding Resistance :

Pump Speed (r.p.m)	Sliding Resistance (g)
0	Below 50
200	Below 30
1,000	Below 20



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# INJ. PUMP CALIBRATION DATA

ENGINE MODEL J774

BOSCH No. 9 443 610 080  
DKKC No. 104294 — 4000  
Date: 29, Sept. 1989  
Company: ISHIKAWAJIMA  
No. 13101 7250

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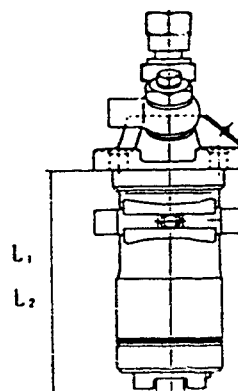
INJ. Pump Ass'y No. 104294 — 4000 (NP — PFR4KD55/2NP7)

## 1. Test Conditions :

Nozzle & Nozzle Holder Ass'y No. : 105780 — 8140  
Nozzle No. : 105780 — 0000 (Bosch Type No. DN12SD12T)  
Nozzle Holder No. : 105780 — 2080 (Bosch Type No. EF8511/9A)  
Nozzle Opening Press. :  $120^{+5}$  Kg/cm<sup>2</sup>      Transfer Pump Press. : 0.5 Kg/cm<sup>2</sup>  
Injection Pipe No. : 157805 — 3320  
Inner Dia. 2 mm × Outer Dia. 6 mm — Length 600 mm  
Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d)    Oil Temp. :  $35^{+10}$  °C  
Cam Profile : PFK — T — 00      (Tangential Cam , Cam Lift 7 mm , Base Circle  $\phi$  28)

## 2. Injection Timing :

PRE-STROKE :  $2.1 \pm 0.05$  mm  
 $L_1$  (Port Closing Dimension) :  $73.9 \pm 0.05$  mm  
 $L_2$  (Mounting Dimension) :  $76.0 \pm 0.05$  mm



## 3. Injection Quantity :

Rod Position (mm)	Pump Speed (r.p.m)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
a	1,400	28.2 ~ 28.8	—	Rod	Basic

## 4. Control Rod Sliding Resistance :

Pump Speed (r.p.m)	Sliding Resistance (g)
0	Below 50
200	Below 30
1,000	Below 20



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# INJ. PUMP CALIBRATION DATA

ENGINE MODEL J774

BOSCH No. 9 443 610 055  
DKKC No. 104294 — 4011  
Date: 29. Sept. 1989  
Company: ISHIKAWAJIMA  
No. 13101 7252

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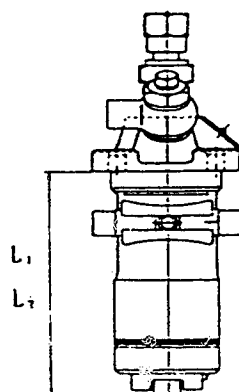
INJ. Pump Ass'y No. 104294 — 4011 (NP — PFR4KD55/2NP9)

## 1. Test Conditions :

Nozzle & Nozzle Holder Ass'y No. : 105780 — 8140  
Nozzle No. : 105780 — 0000 (Bosch Type No. DN12SD12T)  
Nozzle Holder No. : 105780 — 2080 (Bosch Type No. EF8511/9A)  
Nozzle Opening Press. :  $120 \cdot 5 \text{ Kg/cm}^2$  Transfer Pump Press. :  $0.5 \text{ Kg/cm}^2$   
Injection Pipe No. : 157805 — 3320  
Inner Dia. 2 mm × Outer Dia. 6 mm — Length 600 mm  
Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. :  $35 \cdot 10^\circ \text{C}$   
Cam Profile : PFK — T — 00 (Tangential Cam , Cam Lift 7 mm , Base Circle  $\phi 28$ )

## 2. Injection Timing :

PRE-STROKE :  $2.1 \pm 0.05 \text{ mm}$   
 $L_1$  (Port Closing Dimension) :  $73.9 \pm 0.05 \text{ mm}$   
 $L_2$  (Mounting Dimension) :  $76.0 \pm 0.05 \text{ mm}$



## 3. Injection Quantity :

Rod Position (mm)	Pump Speed (r.p.m)	Injection Q'ty (cc/1000 strokes)	Max. var bat. cyl (%)	Fixed	Remarks
a	1,400	28.2 ~ 28.8	—	Rod	Basic

## 4. Control Rod Sliding Resistance :

Pump Speed (r.p.m)	Sliding Resistance (g)
0	Below 50
200	Below 30
1,000	Below 20



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# INJ. PUMP CALIBRATION DATA

ENGINE MODEL N843, J843, J823

INJ. Pump Ass'y No. 104296 — 3010 (NP — PFR3KD65/2NP23)

BOSCH No. 9 443 610 081

DKKC No. 104296 — 3010

Date: 29, Sept. 1989

Company: ISHIKAWAJIMA

No. 13101 7400

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## 1. Test Conditions :

Nozzle & Nozzle Holder Ass'y No. : 105780 — 8140

Nozzle No. : 105780 — 0000 (Bosch Type No. DN12SD12T)

Nozzle Holder No. : 105780 — 2080 (Bosch Type No. EF8511/9A)

Nozzle Opening Press. :  $120 \times 10^5$  Kg/cm<sup>2</sup> Transfer Pump Press. : 0.5 Kg/cm<sup>2</sup>

Injection Pipe No. : 157805 — 3320

Inner Dia. 2 mm × Outer Dia. 6 mm — Length 600 mm

Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. :  $35 \pm 10$  °C

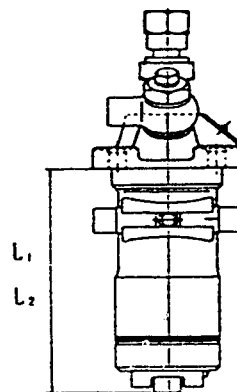
Cam Profile : PFK — T — 00 (Tangential Cam, Cam Lift 7 mm, Base Circle  $\phi$  28)

## 2. Injection Timing :

PRE-STROKE :  $2.45 \pm 0.05$  mm

L<sub>1</sub> (Port Closing Dimension) :  $73.55 \pm 0.05$  mm

L<sub>2</sub> (Mounting Dimension) :  $76.0 \pm 0.05$  mm



## 3. Injection Quantity :

Rod Position (mm)	Pump Speed (r.p.m)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
a	900	29.4 ~ 30.6	—	Rod	Basic

## 4. Control Rod Sliding Resistance :

Pump Speed (r.p.m)	Sliding Resistance (g)
0	Below 50
200	Below 30
1,000	Below 20



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# **INJ. PUMP CALIBRATION DATA**

TEST OIL:  
ISO 4113 or  
SAE J967d

ENGINE MODEL : T853

BOSCH No. 9 400 610 089 1/3  
DKKC No. 104303 — 3340  
Date : 29, Sept. 1989  
Company : ISHIKAWAJIMA  
No. 13101 7130

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104303 — 3340 2/3

Injection pump : PES3K Governor : Timing device :  
104300-3900

## **1. Test Conditions :**

Pump rotation : clockwise-viewed from drive side

Nozzle : 105780-0000 Nozzle Holder : 105780-2080  
(BOSCH Type No. DN12SD12T) (BOSCH Type No. EF8511/9A)  
Nozzle opening pressure : 175 kg/cm<sup>2</sup> Transfer pump pressure : 1.6 kg/cm<sup>2</sup>  
Injection pipe :  
Inner Dia. 2 mm x Outer Dia. 6 mm — Length 600 mm

Test Oil : ISO4113 or SAE Standard Test Oil (SAE J967d) Oil Temp. : 40±5°C

Overflow valve opening pressure : — kg/cm<sup>2</sup>

## **2. Injection Timing :**

Pre-stroke : No. 1 Plunger 1.95 ± 0.05 mm

Note : Adjust with control rod position of mm

Injection order : 1 ~ 2 ~ 3 (interval : 120° ± 30°)

Plungers are numbered from the Drive side.

Tappet clearance : Bolt adjustment type ; More than 0.3 mm for all cylinders.  
Shim adjustment type ; Manually rotate the camshaft 2 ~ 3 times and confirm that it rotates smoothly.

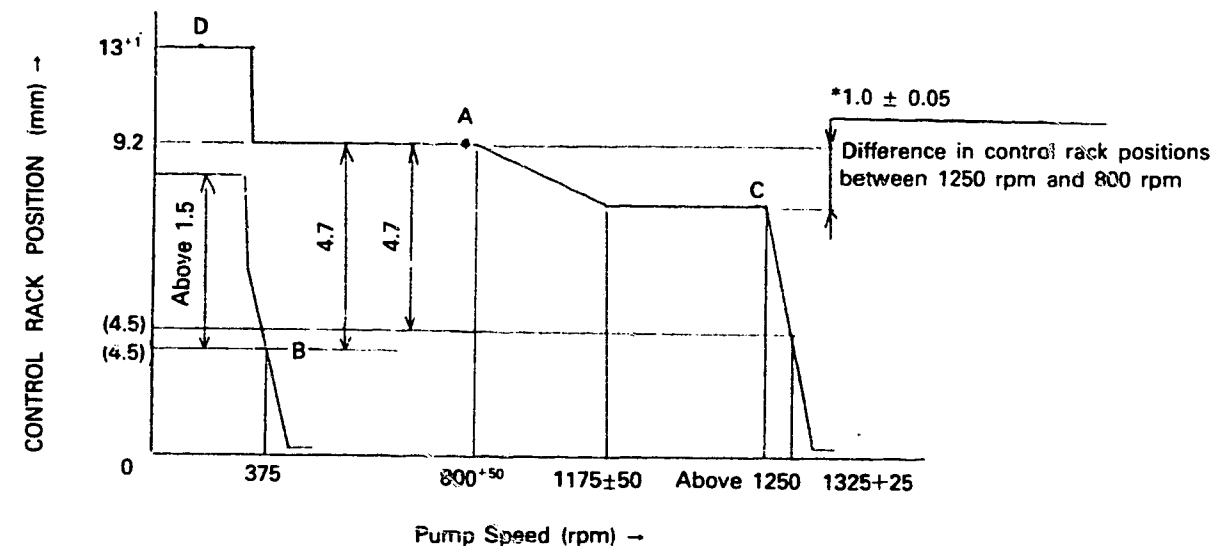
## **4. Injection Quantity :**

Adjust- ing Point	Rod Position (mm)	Pump Speed (r.p.m.)	Injection Q'ty (cc/1000 strokes)	Max. var bet. cyl (%)	Fixed	Remarks
A	9.2	800	41.0 ~ 43.0	—	Lever	
B	Approx. 4.5	375	5.2 ~ 7.2	—	Lever	
C	8.2	1,250	36.8 ~ 40.8	—	Lever	
D	13 + 1	100	Above 50	—	Lever	

## **5. Timing Advance Specification :**

Pump Speed (r.p.m.)							
Advance Angle (deg)							

## **GOVERNOR ADJUSTMENT**

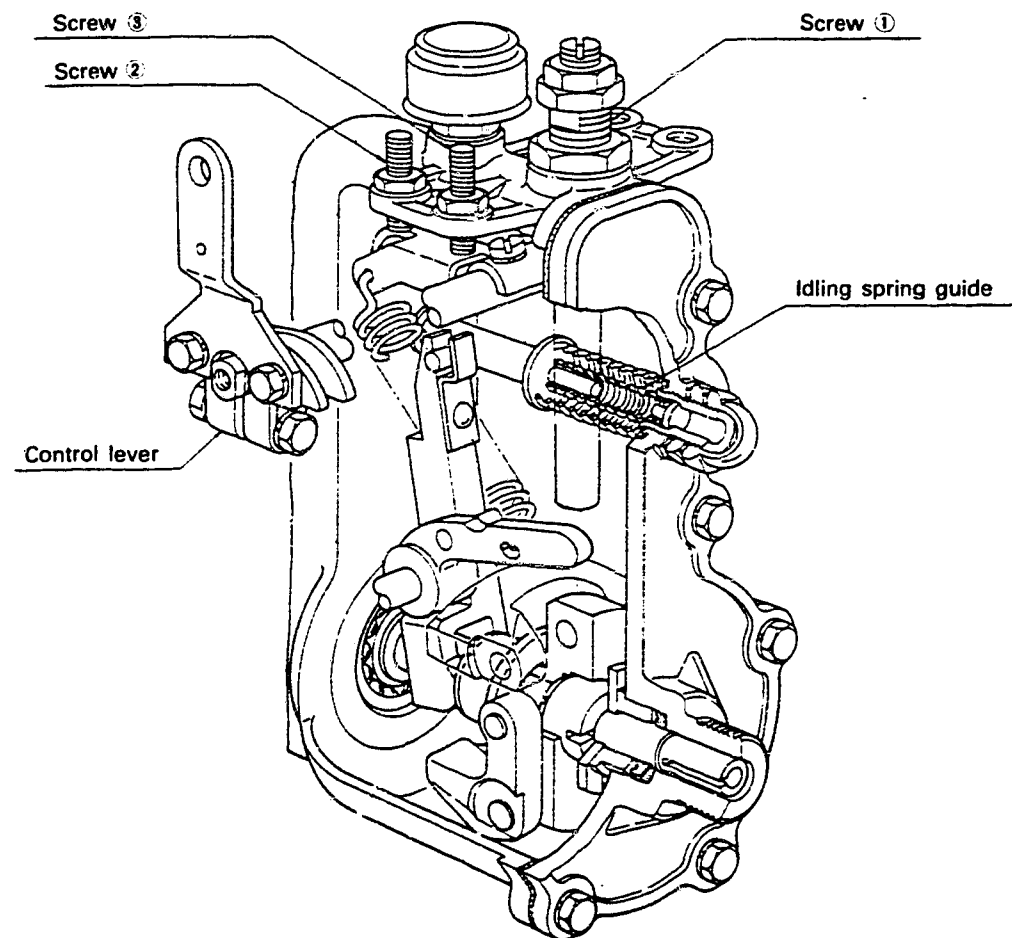


## **Adjustment**

Item	Pump Speed (rpm)	Rack position (mm)	Remarks
Full-load adjustment (temporary)	1250	8.2	• Adjust using screw 1
	1250	8.2	• Confirm injection quantity at point A • Confirm the control lever angle (27° ~ 33°)
Maximum speed adjustment	Fix the control lever in the full-speed position		
	1325 ~ 1350 Above 1250	(4.5) 8.2	• Confirm • Adjust using screw 2
Idling adjustment	375	(4.5)	• Adjust using idling spring guide
	1250	8.2	• Confirm injection quantity at point C
	0	13.1	• Confirm
Stopper bolt adjustment	100	(4.5) - 1	• Adjust using screw 3
Torque Control Spring Adjustment	1250	8.2	• Move the control lever
	800 ~ 850	9.2	• Adjust using screw 4
	1125 ~ 1225	8.2	• Torque control stroke 1 mm is adjusted by shims. • Confirm the torque control stroke is 1 mm.



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Service Department Tel (03) 400-1551 Fax (03) 499-4115



# **INJ. PUMP CALIBRATION DATA** **Distributor-type**

TEST OIL:  
I S O 4113 or  
S A E J967d

MOTOR: 4D56T

Injection pump No.: 104640 — 3363 [NP—VE4/10F2100RNP431]

Pump rotation : clockwise-viewed from drive side

Pre-stroke : — mm

1/4  
BOSCH No. 9 460 610 372  
DKKC No. 104740 — 3663  
Date : 29, Sept. 1989  
Company : MITSUBISHI  
No. MD103209

For Test Condition see  
Microfiche No.WP-210(N16)  
Spec. A

**C - 8**

104740 — 3663 2/4

○ Note

■ After adjustment of full load fuel injection quantity ( 1250 rpm ) , set the boost pressure at 330 mm Hg or 0.45 kg/cm<sup>2</sup> , and at pump speed of 750 rpm adjust the fuel injection quantity using the BCS spring set screw.

○ Note

■ To adjust the timer stroke, supply boost pressure of 550 mmHg ( 0.75 kg/cm<sup>2</sup> ) , move the control lever to a position where the full-load injection quantity can be obtained, and then adjust the timer stroke.

1. Setting	Pump speed (rpm)	Settings	Charge air press(mmHg)	Difference in delivery(cc)
1-1 Timing device travel	1,250	T=3.5~ 3.9 (mm)	540~560	
1-2 Supply pump pressure	1,250	4.5~ 5.1 (kg/cm <sup>2</sup> )	540~560	
1-3 Full load delivery without charge air pressure	1,250	61.4~62.4 (cc/1,000st)	540~560	4.5
Full load delivery with charge air pressure	750	60.4~61.4 (cc/1,000st)	320~340	
1-4 Idle speed regulation	375	6.5~ 9.5 (cc/1,000st)	0	2.0
1-5 Start	100	63.0~83.0 (cc/1,000st)	0	
1-6 Full-load speed regulation	2,650	22.2~28.2 (cc/1,000st)	540~560	5.5
1-7 Load-timer Adjustment	1,250	T=0.6±0.2mm	540~560	
1-8				

## **2. Test Specifications**

2-1 Timing device	N = rpm	500	750	1,250	2,100
	mm	0.6~ 1.8	1.4~ 2.6	3.3~ 4.1	6.6~ 7.8
2-2 Supply pump	N = rpm	600	1,250	2,100	
	kg/cm <sup>2</sup>	2.9~ 3.5	4.5~ 5.1	6.5~ 7.1	
2-3 Overflow delivery	N = rpm	1,250			
	cc/10s	48.0~92.0			

## **2-4 Fuel injection quantities**

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery(cc)
Full speed position	1,250	60.9~62.9	540~560	
	600	45.8~50.8	0	
	750	59.9~61.9	320~340	
	2,100	52.8~57.8	540~560	
	2,650	20.2~30.2	540~560	
	3050	Below 5.0	540~560	

Switch OFF	375	0	0
Idling position	600	Below 3.0	0
	375	6.0~10.0	0

2-5 Solenoid Max.cut-in voltage : 8 V  
Test voltage : 12~14 V

## **3. Dimensions**

K	3.2~3.4	mm
KF	5.7~5.9	mm
MS	0.9~1.1	mm
BCS	3.6~3.8	mm

## **Control lever angle**

α	55.0~63.0	deg
A	10.5~16.0	mm
β	40.0~50.0	deg
B	12.1~16.1	mm
γ	—	deg
C	—	mm



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## LOAD TIMER ADJUSTMENT

### 1) Adjustment

- ① Fix the control lever in the position satisfying the following conditions.

Boost Pressure : 540~560 mmHg

Pump Speed : 1250 rpm

Fuel Injection :  $50.3 \pm 0.5$  cc/1000st  
Quantity

- ② With the control lever positioned as described in ① above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values

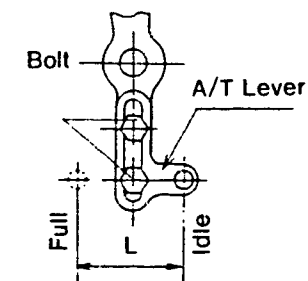
### 2) Confirmation of Timer Characteristics

Fix the control lever in the position satisfying the following conditions, and confirm the Timer Stroke.

Control lever position			Specified Values	
Pump speed (rpm)	Fuel Injection Quantity(cc/1000st)	Boost pressure (mmHg)	Timer stroke (mm)	Timer stroke reduction value (mm)
1250	49.3~51.3	540~560	(3.1)	0.2~1.0
1250	38.7~41.7	540~560	(2.3)	0.8~2.0

## A/T LINK LEVER ADJUSTMENT

- ① Move the control lever from the idling position to the full speed position and confirm that the A/T lever stroke (L) is  $32.9 \pm 1$  mm.
- ② If dimension L is not as specified, loosen the bolt and adjust by altering the A/T lever position.
- ③ After adjustment, securely tighten the bolt.



# **INJ. PUMP CALIBRATION DATA** **Distributor-type**

TEST OIL:  
 I S O 4113 or  
 S A E J967d

ENGINE MODEL : 4JB1 — PK01

BOSCH No. 9 460 610 317  
 DKKC No. 104741 — 1353  
 Date : 29, Sept. 1989 0  
 Company : ISUZU  
 No. 894435 0851

**C - 10**

Injection pump No.: 104641—1113 [NP—VE4/11F1300LNP387]

Pump rotation : Counter clockwise-viewed from drive side

For Test Condition see  
 Microfiche No. WP-210 (N-16)  
 Spec. A

Pre-stroke : 0.43 ~ 0.47 mm

1. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
1—1	Timing device travel	1,400	0 (mm)		
1—2	Supply pump pressure	800	2.6 ~ 3.0 (kg/cm <sup>2</sup> )		
1—3	Full load delivery without charge air pressure	800	39.9 ~ 40.9 (cc/1,000st)		3.5
	Full load delivery with charge air pressure		(cc/1,000st)		
1—4	Idle speed regulation	500	7.6 ~ 11.6 (cc/1,000st)		2.0
1—5	Start	100	75.0 ~ 115.0 (cc/1,000st)		
1—6	Full-load speed regulation	1,400	18.9 ~ 24.9 (cc/1,000st)		4.5
1—7					
1—8					

## **2. Test Specifications**

2—1	Timing device	N = rpm mm	1,400 0		
2—2	Supply pump	N = rpm kg/cm <sup>2</sup>	600 1.8 ~ 2.4	800 2.6 ~ 3.0	1,300 4.4 ~ 5.0
2—3	Overflow delivery	N = rpm cc/10s	800 30.0 ~ 73.3		
2—4	Fuel injection quantities				
	Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
	End stop	800	39.4 ~ 41.4		
		500	41.3 ~ 49.4		
		700	38.9 ~ 44.0		
		1,000	37.9 ~ 43.0		
		1,300	38.0 ~ 44.1		
		1,350	34.1 ~ 43.2		
		1,400	18.4 ~ 25.5		
		1,450	Below 5.0		
	Switch OFF	500	0		
	Idling position	500	7.6 ~ 11.6		
		600	Below 3.0		
2—5	Solenoid	Max. cut-in voltage: 8 V Test voltage: 12 ~ 14 V			

## **3. Dimensions**

K	2.7 ~ 2.9 mm
KF	4.9 ~ 5.1 mm
MS	0.9 ~ 1.1 mm
BCS	— mm
Control lever angle	
$\alpha$	14.0 ~ 22.0 deg
A	2.5 ~ 7.6 mm
$\beta$	30.5 ~ 40.5 deg
B	8.9 ~ 12.7 mm
$\gamma$	— deg
C	— mm



**DIESEL KIKI**

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 Service Department

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# INJ. PUMP CALIBRATION DATA

TEST OIL:  
ISO 4113 or  
SAE J967d

ENGINE MODEL : 4LH-HTE

BOSCH No. 9 460 610 362

DKKC No. 104742-7001

Date : 29, Sept. 1989

Company : YANMAR DIESEL

No. 11917251900

Injection pump No.: 104642-7001 [NP-VE4/12F1650RNP545]

Pump rotation : Clockwise-viewed from drive side

For Test Condition see Spec. B  
Microfiche No. WP-210 (N-16)

C - 11

## 1. Test Conditions

1-1 Nozzle : 105780-0060 (NP-DN0SD1510)	1-5 Fuel oil temperature : 45 <sup>±5</sup> °C
1-2 Nozzle holder : 105780-2150	1-6 Supply pump pressure : 0.2 kg/cm <sup>2</sup>
1-3 Nozzle opening pressure : 133 <sup>±3</sup> kg/cm <sup>2</sup>	1-7 Joint ass'y : 157641-4720
1-4 Injection pipe : 2 x 6 x 450 mm	1-8 Tube ass'y : 157641-4020

2. Setting	Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel	1,000	1.1 ~ 1.5 (mm)		
2-2 Supply pump pressure	1,000	3.7 ~ 4.3 (kg/cm <sup>2</sup> )		
2-3 Full load delivery	1,000	80.0 ~ 81.0 (cc/1,000st)		4.0
Full load delivery		(cc/1,000st)		
2-4 Idle speed regulation	400	11.0 ~ 15.0 (cc/1,000st)		2.5
2-5 Start	100	100 ~ 140 (cc/1,000st)		
2-6 Full-load speed regulation	1,840	13.0 ~ 19.0 (cc/1,000st)		
2-7				
2-8				

## 3. Test Specifications

3-1 Timing device	N = rpm mm	1,000 1.1 ~ 1.5	1,500 2.0 ~ 2.9
3-2 Supply pump	N = rpm kg/cm <sup>2</sup>	1,000 3.7 ~ 4.3	1,500 4.8 ~ 5.4
3-3 Overflow delivery	N = rpm cc/10s	1,000 45.0 ~ 88.0	

## 3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press (mmHg)	Difference in delivery (cc)
Max. speed	1,000	79.5 ~ 81.5		
	1,500	84.8 ~ 91.8		
	1,650	83.5 ~ 90.5		
	1,840	12.5 ~ 19.5		
	1,900	Below 4.0		
Switch OFF Magnet valve	100 400	0 0		
Idling	400 500	11.0 ~ 15.0 Below 8.0		
3-5 Solenoid	Max. cut-in voltage: 8 V, Test voltage: 12 ~ 14 V			

## 4. Dimensions

K	3.0 ~ 3.2	mm
KF	5.4 ~ 5.6	mm
MS	0.9 ~ 1.1	mm
BCS	—	mm
Pre-stroke	0.43 ~ 0.47	mm
Control lever angle		
$\alpha$	21° ~ 29°	deg
A	—	mm
$\beta$	35° ~ 45°	deg
B	—	mm
$\gamma$	—	deg
C	—	mm



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Service Department

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# INJ. PUMP CALIBRATION DATA

TEST OIL:  
ISO 4113 or  
SAE J967d

ENGINE MODEL : 4LH-HTE

BOSCH No. 9 460 610 363

DKKC No. 104742-7010

Date : 29, Sept. 1989

Company : YANMAR DIESEL

No. 11917251901

For Test Condition see Spec. B  
Microfiche No. WP-210 (N-16)

1/2

C - 12

104742-7010 2/2

Injection pump No.: 104642-7010 [NP-VE4/12F1650RNP545]

Pump rotation : Clockwise-viewed from drive side

## 1. Test Conditions

1-1 Nozzle : 105780-0060 (NP-DN0SD1510)	1-5 Fuel oil temperature : 45 <sup>±5</sup> °C
1-2 Nozzle holder : 105780-2150	1-6 Supply pump pressure : 0.2 kg/cm <sup>2</sup>
1-3 Nozzle opening pressure : 133 <sup>±3</sup> kg/cm <sup>2</sup>	1-7 Joint ass'y : 157641-4720
1-4 Injection pipe : 2 x 6 x 450 mm	1-8 Tube ass'y : 157641-4020

2. Setting	Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel	1,000	1.1 ~ 1.5 (mm)		
2-2 Supply pump pressure	1,000	3.7 ~ 4.3 (kg/cm <sup>2</sup> )		
2-3 Full load delivery	1,000	80.0 ~ 81.0 (cc/1,000st)		4.0
Full load delivery		(cc/1,000st)		
2-4 Idle speed regulation	400	11.0 ~ 15.0 (cc/1,000st)		3.0
2-5 Start	100	100 ~ 140 (cc/1,000st)		
2-6 Full-load speed regulation	1,840	12.0 ~ 20.0 (cc/1,000st)		
2-7				
2-8				

## 3. Test Specifications

3-1 Timing device	N = rpm mm	1,000 1.1 ~ 1.5	1,500 2.0 ~ 2.9
3-2 Supply pump	N = rpm kg/cm <sup>2</sup>	1,000 3.7 ~ 4.3	1,500 4.8 ~ 5.4
3-3 Overflow delivery	N = rpm cc/10s	1,000 45.0 ~ 88.0	

## 3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press (mmHg)	Difference in delivery (cc)
Max. speed	1,000	79.5 ~ 81.5		
	1,500	84.0 ~ 92.0		
	1,650	84.0 ~ 92.0		
	1,840	11.5 ~ 20.5		
	1,900	Below 4.0		
Switch ON Magnet valve	100 400	0 0		
Idling	400 500	11.0 ~ 15.0 Below 6.0		

## 4. Dimensions

K	3.0 ~ 3.2	mm
KF	5.4 ~ 5.6	mm
MS	0.9 ~ 1.1	mm
BCS	—	mm
Pre-stroke	0.43 ~ 0.47	mm
Control lever angle		
α	21° ~ 29°	deg
A	—	mm
β	35° ~ 45°	deg
B	—	mm
γ	—	deg
C	—	mm

3-5 Solenoid Max. cut-in voltage: 8 V, Test voltage: 12 ~ 14 V

■ Adjust the pump with the magnet valve OFF.

■ Full-load Screw Temporary Adjustment

During assembly adjust the full-load screw so that it protrudes 14 ± 0.5 mm from the nut.

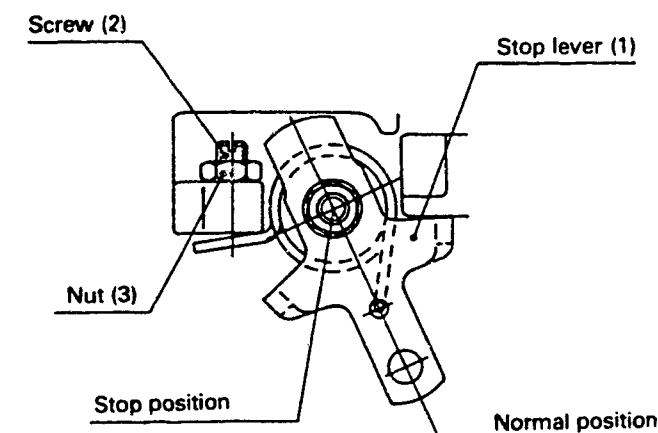
■ Attach the timer's measuring device to the low pressure side.

■ Stop Lever Adjustment

1. Adjust the stop lever so that in the normal position the fuel injection quantity for starting is as specified.
2. Operate the pump at the specified idling speed of 325 rpm and pull the stop lever in the "stop" direction.
3. Then, adjust the fuel injection quantity to "0" using the screw (2).
4. Unscrew screw (2) one turn so that the clearance between the stop lever and the tip of the screw is 1 mm, and then fix the screw using the nut (3).

(Specified torque: 0.6 ~ 0.9 kg-m)  
Note: When the head of the screw (2) does not protrude from the nut (3), unscrew it until it does even though the clearance will exceed 1 mm. A clearance exceeding 1 mm is acceptable.

5. If the stop lever cannot be adjusted using the above procedure, shift its installation position one tooth and repeat procedures 1 to 4 above.



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Service Department

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# INJ. PUMP CALIBRATION DATA

1/2

TEST OIL:  
ISO 4113 or  
SAE J967d

ENGINE MODEL : 4LH-TE

BOSCH No. 9 460 610 364

DKKC No. 104742-7020

Date : 29, Sept. 1989

Company : YANMAR DIESEL

No. 11917151900

C - 13

104742-7020 2/2

Injection pump No.: 104642-7020 [NP-VE4/2F1650RNP667]

Pump rotation : Clockwise-viewed from drive side

For Test Condition see Beschreibung B  
Microfiche No. WP-210 (N-16)

## 1. Test Conditions

1-1 Nozzle : 105780-0060 (NP-DN0SD1510)	1-5 Fuel oil temperature : 45 <sup>±5</sup> °C
1-2 Nozzle holder : 105780-2150	1-6 Supply pump pressure : 0.2 kg/cm <sup>2</sup>
1-3 Nozzle opening pressure : 133 <sup>±3</sup> kg/cm <sup>2</sup>	1-7 Joint ass'y : 157641-4720
1-4 Injection pipe : 2 x 6 x 450 mm	1-8 Tube ass'y : 157641-4020

2. Setting	Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel	1,000	1.1 ~ 1.5 (mm)		
2-2 Supply pump pressure	1,000	3.7 ~ 4.3 (kg/cm <sup>2</sup> )		
2-3 Full load delivery	1,000	85.9 ~ 86.9 (cc/1,000st)		4.0
Full load delivery		(cc/1,000st)		
2-4 Idle speed regulation	350	11.0 ~ 15.0 (cc/1,000st)		3.0
2-5 Start	100	100 ~ 140 (cc/1,000st)		
2-6 Full-load speed regulation	1,840	12.0 ~ 20.0 (cc/1,000st)		
2-7				
2-8				

## 3. Test Specifications

3-1 Timing device	N = rpm mm	1,000 1.1 ~ 1.5	1,500 2.0 ~ 2.9
3-2 Supply pump	N = rpm kg/cm <sup>2</sup>	1,000 3.7 ~ 4.3	1,500 4.8 ~ 5.4
3-3 Overflow delivery	N = rpm cc/10s	1,000 45.0 ~ 88.0	

## 3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press (mmHg)	Difference in delivery (cc)
Max. speed	1,000	85.4 ~ 87.4		
	1,500	73.6 ~ 81.6		
	1,650	69.4 ~ 77.4		
	1,840	11.5 ~ 20.5		
	1,900	Below 4.0		
Switch ON Magnet valve	100 350	0 0		
Idling	350 450	11.0 ~ 15.0 Below 6.0		

## 4. Dimensions

K	3.0 ~ 3.2	mm
KF	5.4 ~ 5.6	mm
MS	0.9 ~ 1.1	mm
BCS	—	mm
Pre-stroke	0.43 ~ 0.47	mm

## Control lever angle

$\alpha$	21° ~ 29°	deg
A	—	mm
$\beta$	35° ~ 45°	deg
B	—	mm
$\gamma$	—	deg
C	—	mm

3-5 Solenoid Max. cut-in voltage: 8 V, Test voltage: 12 ~ 14 V

■ Adjust the pump with the magnet valve OFF.

■ Full-load Screw Temporary Adjustment

During assembly adjust the full-load screw so that it protrudes 14 ± 0.5 mm from the nut.

■ Attach the timer's measuring device to the low pressure side.

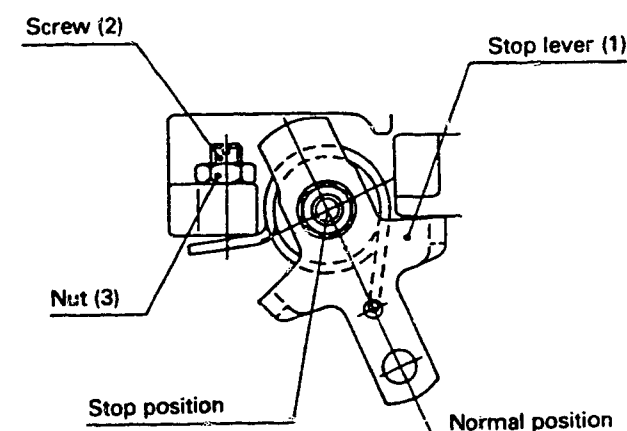
■ Stop Lever Adjustment

1. Adjust the stop lever so that in the normal position the fuel injection quantity for starting is as specified.
2. Operate the pump at the specified idling speed of 325 rpm and pull the stop lever in the "stop" direction.
3. Then, adjust the fuel injection quantity to "0" using the screw (2).
4. Unscrew screw (2) one turn so that the clearance between the stop lever and the tip of the screw is 1 mm, and then fix the screw using the nut (3).

(Specified torque: 0.6 ~ 0.9 kg-m)

Note: When the head of the screw (2) does not protrude from the nut (3), unscrew it until it does even though the clearance will exceed 1 mm. A clearance exceeding 1 mm is acceptable.

5. If the stop lever cannot be adjusted using the above procedure, shift its installation position one tooth and repeat procedures 1 to 4 above.



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# INJ. PUMP CALIBRATION DATA

1/2

TEST OIL:  
ISO 4113 or  
SAE J967d

ENGINE MODEL : 4LH-HTZ

BOSCH No. 9 460 610 365

DKKC No. 104742-7030

Date : 29, Sept. 1989

Company : YANMAR DIESEL

No. 119182-51900

For Test Condition see Spec. B  
Microfiche No. WP-210 (N-16)

C - 14

104742-7030 2/2

Injection pump No.: 104642-7030 [NP-VE4/12F1650RNP673]

Pump rotation : Clockwise-viewed from drive side

## 1. Test Conditions

1-1 Nozzle : 105780-0060 (NP-DN0SD1510)	1-5 Fuel oil temperature : 45 <sup>±5</sup> °C
1-2 Nozzle holder : 105780-2150	1-6 Supply pump pressure : 0.2 kg/cm <sup>2</sup>
1-3 Nozzle opening pressure : 133 <sup>±3</sup> kg/cm <sup>2</sup>	1-7 Joint ass'y : 157641-4720
1-4 Injection pipe : 2 x 6 x 450 mm	1-8 Tube ass'y : 157641-4020

2. Setting	Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
2-1 Timing device travel	1,000	1.1 ~ 1.5 (mm)		
2-2 Supply pump pressure	1,000	3.7 ~ 4.3 (kg/cm <sup>2</sup> )		
2-3 Full load delivery	1,000	80.0 ~ 81.0 (cc/1,000st)		4.0
Full load delivery		(cc/1,000st)		
2-4 Idle speed regulation	325	12.6 ~ 16.6 (cc/1,000st)		3.5
2-5 Start	100	100 ~ 140 (cc/1,000st)		
2-6 Full-load speed regulation	1,840	12.0 ~ 20.0 (cc/1,000st)		
2-7				
2-8				

## 3. Test Specifications

3-1 Timing device	N = rpm mm	1,000 1.1 ~ 1.5	1,500 2.0 ~ 2.9
3-2 Supply pump	N = rpm kg/cm <sup>2</sup>	1,000 3.7 ~ 4.3	1,500 4.8 ~ 5.4
3-3 Overflow delivery	N = rpm cc/10s	100 45.0 ~ 88.0	

## 3-4 Fuel injection quantities

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press (mmHg)	Difference in delivery (cc)
Max. speed	1,000	79.5 ~ 81.5		
	1,500	84.0 ~ 92.0		
	1,650	84.0 ~ 92.0		
	1,840	11.5 ~ 20.5		
	1,900	Below 4.0		
Switch OFF Magnet valve	100	0		
	325	0		
Idling	325	12.6 ~ 16.6		
	400	Below 6.0		
3-5 Solenoid	Max. cut-in voltage: 8 V, Test voltage: 12 ~ 14 V			

## 4. Dimensions

K	3.0 ~ 3.2	mm
KF	5.4 ~ 5.6	mm
MS	0.9 ~ 1.1	mm
BCS	—	mm
Pre-stroke	0.43 ~ 0.47	mm
Control lever angle		
α	21° ~ 29°	deg
A	—	mm
β	38° ~ 48°	deg
B	—	mm
γ	—	deg
C	—	mm

■ Adjust the pump with the magnet valve OFF.

■ Full-load Screw Temporary Adjustment

During assembly adjust the full-load screw so that it protrudes 14 ± 0.5 mm from the nut.

■ Attach the timer's measuring device to the low pressure side.

■ Stop Lever Adjustment

1. Adjust the stop lever so that in the normal position the fuel injection quantity for starting is as specified.

2. Operate the pump at the specified idling speed of 325 rpm and pull the stop lever in the "stop" direction.

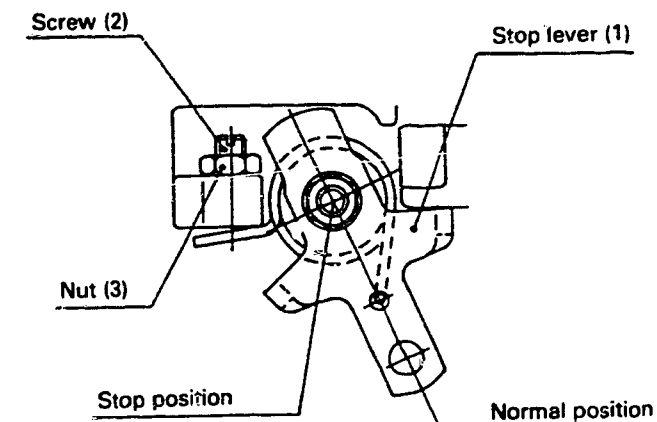
3. Then, adjust the fuel injection quantity to "0" using the screw (2).

4. Unscrew screw (2) one turn so that the clearance between the stop lever and the tip of the screw is 1 mm, and then fix the screw using the nut (3).

(Specified torque: 0.6 ~ 0.9 kg-m)

Note: When the head of the screw (2) does not protrude from the nut (3), unscrew it until it does even though the clearance will exceed 1 mm. A clearance exceeding 1 mm is acceptable.

5. If the stop lever cannot be adjusted using the above procedure, shift its installation position one tooth and repeat procedures 1 to 4 above.



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3-6-7 SHIBUYA, SHIBUYA-KU, TOKYO 150, JAPAN  
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# INJ. PUMP CALIBRATION DATA

## Distributor-type

TEST OIL:  
ISO 4113 or  
S A E J967d

ENGINE MODEL : R2

Injection pump No.: 104648 — 0223 [NP—VE4/8F2125RNP319]

Pump rotation : clockwise-viewed from drive side

Pre-stroke : — mm

BOSCH No. 9 460 610 359 1/3

DKKC No. 104748 — 0223

Date : 29, Sept. 1989 0

Company : MAZDA

No. R230 13 800B

For Test Condition see  
Microfiche No. WP-210 (N-16)  
Spec. A

# C - 15

104748 — 0223 2/3

1. Setting	Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
1—1 Timing device travel	1,500	4.5 ~ 4.9 (mm)		
1—2 Supply pump pressure	1,500	5.6 ~ 6.2 (kg/cm <sup>2</sup> )		
1—3 Full load delivery without charge air pressure	1,500	37.0 ~ 38.0 (cc/1,000st)		3.0
Full load delivery with charge air pressure		(cc/1,000st)		
1—4 Idle speed regulation	350	6.0 ~ 10.0 (cc/1,000st)		2.0
1—5 Start	100	Above 42 (cc/1,000st)		
1—6 Full-load speed regulation	2,400	11.1 ~ 15.1 (cc/1,000st)		
1—7				
1—8				

## 2. Test Specifications

2—1 Timing device	N = rpm mm	1,250 2.9 ~ 4.1	1,500 4.4 ~ 5.0	2,125 7.0 ~ 8.2
2—2 Supply pump	N = rpm kg/cm <sup>2</sup>	500 2.7 ~ 3.3	1,500 5.6 ~ 6.2	2,125 7.3 ~ 7.9
2—3 Overflow delivery	N = rpm cc/10s	1,500 55.0 ~ 98.3		
2—4 Fuel injection quantities				
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press (mmHg)	Difference in delivery (cc)
Full speed position	1,500	36.5 ~ 38.5		
	500	29.5 ~ 33.5		
	2,125	30.8 ~ 34.8		
	2,400	10.1 ~ 16.1		
	2,550	Below 4.0		
Switch OFF	350	0		
Idling position	350 455	6.0 ~ 10.0 Below 4.0		
2—5 Solenoid	Max. cut-in voltage: 8 V Test voltage: 12 ~ 14 V			

## 3. Dimensions

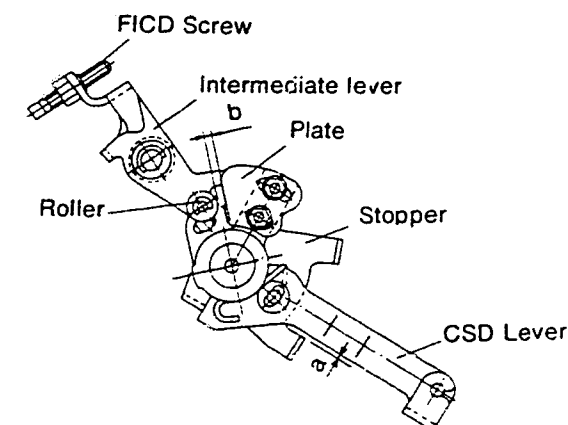
K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.4 ~ 1.6	mm
BCS	—	mm
Control lever angle		
$\alpha$	31.0 ~ 39.0	deg
A	2.5 ~ 7.7	mm
$\beta$	40.0 ~ 50.0	deg
B	12.5 ~ 15.8	mm
$\gamma$	—	deg
C	—	mm

## M — CSD Assembly and Adjustment

### 1) Fixing the M-CSD stopper

- Fix the M-CSD assembly temporarily to the pump housing.
- Turn the drive shaft at least two turns in the direction of pump rotation.
- Turn the drive shaft slowly, and fix the drive shaft in a position where a load is applied (the point where the roller in the roller holder contacts the cam surface of the cam disc).
- Move the CSD lever to the advance side.
- Fix the CSD lever in the position where the ball pin at the tip of the shaft lightly contacts the roller holder (roller holder advance angle "0").
- Adjust the stopper position so that the gap between the CSD lever and the stopper is 0.5 + 2 mm. (Dimension "a").
- After adjustment, tighten the M-CSD screw to the specified torque.

$$T = 0.6 - 0.9 \text{ kg} \cdot \text{m}.$$



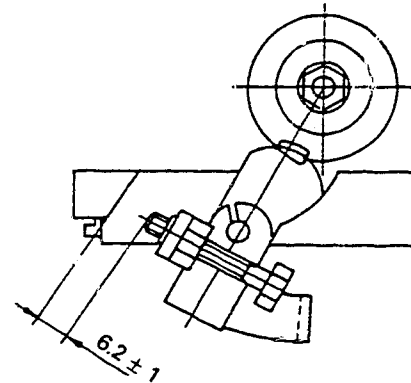
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Service Department

3-6-7 SHIBUYA, SHIBUYA-KU, TOKYO 150, JAPAN  
Tel (03) 400-1551 Fax (03) 499-4115

## 2) Fixing the CSD lever plate

1. Fix the CSD lever in a position where the gap "a" between the CSD lever and stopper is 0 mm.
2. Adjust the plate position so that the gap "b" between the intermediate lever roller and CSD lever plate is 4 mm.

After adjustment, fix the plate in this position with two screws.



## 3) FICD screw adjustment

1. Move the CSD lever so that it contacts the stopper.
2. Insert a block gauge (thickness gauge) of  $6.2 \pm 1$  mm thickness between the control lever and idling stopper bolt.  
(Position 7° from idle).
3. Adjust using the FICD screw so that the control lever and FICD screw are in contact.



# INJ. PUMP CALIBRATION DATA

## Distributor-type

TEST OIL:  
ISO 4113 or  
SAE J967d

ENGINE MODEL : LD20

Injection pump No.: 104649—2242 [NP—VE4/9F2300RNP454]

Pump rotation : clockwise-viewed from drive side

Pre-stroke : — mm

BOSCH No. 9 460 610 393 1/4  
DKKC No. 104749 — 2242  
Date : 29, Sept. 1989 0  
Company : NISSAN  
No. 16700 14C00

For Test Condition see  
Microfiche No. WP-210 (N-16  
Spec. A)

**D - 1**

104749 — 2242 2/4

1. Setting	Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
1—1 Timing device travel	900	T = 1.3 ~ 1.7 (mm)		
1—2 Supply pump pressure	900	3.2 ~ 3.8 (kg/cm <sup>2</sup> )		
1—3 Full load delivery without charge air pressure	900	32.5 ~ 33.5 (cc/1,000st)		2.5
Full load delivery with charge air pressure		(cc/1,000st)		
1—4 Idle speed regulation	350	4.7 ~ 7.7 (cc/1,000st)		
1—5 Start	100	40 ~ 60 (cc/1,000st)		
1—6 Full-load speed regulation	2,500	10.6 ~ 16.6 (cc/1,000st)		
1—7				
1—8				

## 2. Test Specifications

2—1 Timing device	N = rpm mm	900 1.2 ~ 1.8	1,800 5.5 ~ 6.7	2,300 7.7 ~ 8.9
2—2 Supply pump	N = rpm kg/cm <sup>2</sup>	900 3.1 ~ 3.9	1,800 5.1 ~ 5.9	2,300 6.2 ~ 7.0
2—3 Overflow delivery	N = rpm cc/10s	900 35.0 ~ 79.0		
2—4 Fuel injection quantities				
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press (mmHg)	Difference in delivery (cc)
Full speed position	900	32.0 ~ 34.0		
	600	31.2 ~ 35.2		
	2,300	28.9 ~ 32.8		
	2,500	10.1 ~ 17.1		
	2,600	Below 6.0		
Switch OFF	350	0		
Idling position	350	4.2 ~ 8.2		2.5
	500	Below 3.0		
Partial load	900	4.1 ~ 14.1		
2—5 Solenoid	Max. cut-in voltage: 8 V Test voltage: 12 ~ 14 V			

## 3. Dimensions

K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.1 ~ 1.3	mm
BCS	—	mm
Control lever angle		
α	21.0 ~ 29.0	deg
A	4.3 ~ 9.6	mm
β	36.0 ~ 46.0	deg
B	10.9 ~ 14.6	mm
γ	10.5 ~ 11.5	deg
C	6.9 ~ 7.5	mm

## LOAD TIMER ADJUSTMENT

### 1) Adjustment

- ① Fix the control lever in the position satisfying the following conditions.

Boost Pressure : — mmHg

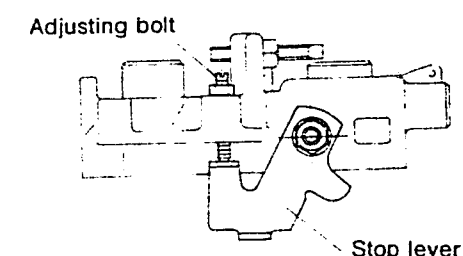
Pump Speed : 900 rpm

Fuel Injection : 17 ± 1 cc/1000st

- ② With the control lever positioned as described in ① above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (page 1/4).

## Starting Injection Quantity Adjustment

Adjust the starting injection quantity (item 1/5) using the adjusting bolt (as shown in the figure at right)

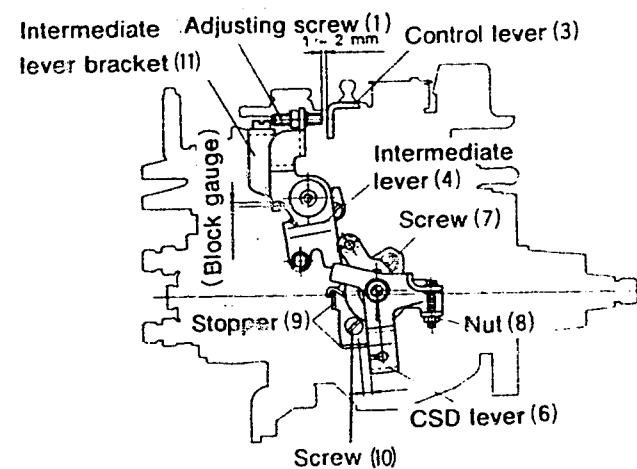


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Tel (03) 400-1551 · Fax (03) 499-4115

### ■ M — CSD Adjustment

- 1) Fix the intermediate lever adjustment screw in position (adjust with the M — CSD released).
  1. Hold the control lever (3) in the idling position.
  2. Insert a 1.5 mm block gauge (thickness gauge) between the intermediate lever (4) and the intermediate lever bracket (11), and then fix the intermediate lever (4) in a position where the adjusting screw (1) is horizontal.
  3. Adjust using the adjusting screw (1) so that the gap between the control lever (3) and the adjusting screw (1) is 1 ~ 2 mm, and then fix the screw using the nut.



### 2) Fixing the M — CSD Stopper (9)

1. Turn the drive shaft slowly and fix the drive shaft in a position where a load is applied (the point where the roller in the roller holder contacts the cam surface of the cam disc).
2. Move the CSD lever (6) to the advance side.
3. Fix the CSD lever in the position where the ball pin at the tip of the shaft lightly contacts the roller holder (roller holder advance angle "0").
4. Adjust the stopper position so that the gap between the CSD lever (6) and the stopper (9) is 4.5 mm, and then fix the stopper using the screw (10).
5. Move the M — CSD lever (6) until it contacts the stopper (9), and check that the timer stroke at this point is  $1.23 \pm 0.2$  mm.

### 3) Screw (7) Adjustment

1. Hold the control lever in the idling position.
2. Adjust using the idling adjusting screw (7) so that the gap between the control lever (3) and the intermediate lever set screw (1) is 1 mm, and then fix the screw (7) using the nut (8).
3. Operate the CSD lever (6) (move the CSD lever until it contacts the stopper (9)).
4. Check that the gap between the control lever (3) and the idling stopper bolt is  $7.2 \pm 0.5$  mm.

# **INJ. PUMP CALIBRATION DATA** **Distributor-type**

TEST OIL:  
I S O 4113 or  
S A E J967d

ENGINE MODEL : LD20

Injection pump No.: 104649-2330 [NP-VE4/9F2500RNP555]

BOSCH No. 9 460 610 370 1/5  
DKKC No. 104749-2330  
Date : 29, Sept. 1989  
Company : NISSAN  
No. 16700 59E10

Pump rotation : clockwise-viewed from drive side

For Test Condition see  
Microfiche No. WP-210 (N-16  
Spec. B)

Pre-stroke : — mm

1. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
1-1	Timing device travel	900	T = 3.5 ~ 3.9 (mm)		
1-2	Supply pump pressure	900	3.5 ~ 4.1 (kg/cm <sup>2</sup> )		
1-3	Full load delivery without charge air pressure	900	30.0 ~ 30.8 (cc/1,000st)		2.0
	Full load delivery with charge air pressure		(cc/1,000st)		
1-4	Idle speed regulation	350	6.4 ~ 8.4 (cc/1,000st)		1.7
1-5	Start	100	45.0 ~ 65.0 (cc/1,000st)		
1-6	Full-load speed regulation	2,700	12.0 ~ 16.0 (cc/1,000st)		4.5
1-7	Load-timer Adjustment	900	T = 0.65 ± 0.2 (mm)		
1-8					

## **2. Test Specifications**

2—1 Timing device	N = rpm mm	900 3.5 ~ 3.9	1,200 4.9 ~ 5.7	1,800 7.9 ~ 9.1	2,300 10.2 ~ 11.1
2—2 Supply pump	N = rpm kg/cm <sup>2</sup>	900 3.5 ~ 4.1		1,800 5.6 ~ 6.2	2,300 6.7 ~ 7.3
2—3 Overflow delivery	N = rpm cc/10s	900 33.0 ~ 77.0			
2—4 Fuel injection quantities					
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)	
Full speed position	900	29.5 ~ 31.3			
	600	29.6 ~ 33.2			
	1,200	33.2 ~ 36.2			
	1,800	32.4 ~ 36.4			
	2,300	32.9 ~ 36.9			
	2,500	32.0 ~ 36.2			
	2,700	11.5 ~ 16.5			
	2,800	Below 6.0			
Switch OFF Magnet valve	350 900	0 0			
Idling	350 500	6.4 ~ 8.4 Below 4.5			
Partial load	600	7.4 ~ 20.4			
3—5 Solenoid Max. cut-in voltage: 8 V, Test voltage: 12 ~ 14 V					

3. Dimensions		
K	3.2 ~ 3.4	mm
KF	5.6 ~ 5.8	mm
MS	0.8 ~ 1.0	mm
BCS	—	mm
Control lever angle		
$\alpha$	21° ~ 29°	deg
A	7.6 ~ 11.7	mm
$\beta$	39° ~ 49°	deg
B	11.9 ~ 15.6	mm
$\gamma$	10.5° ~ 11.5°	deg
C	5.5 ~ 6.1	mm

## **3. Dimensions**

K	3.2 ~ 3.4	mm
KF	5.6 ~ 5.8	mm
MS	0.8 ~ 1.0	mm
BCS	—	mm
Control lever angle		
α	21° ~ 29°	deg
A	7.6 ~ 11.7	mm
β	39° ~ 49°	deg
B	11.9 ~ 15.6	mm
γ	10.5° ~ 11.5°	deg
C	5.5 ~ 6.1	mm

**D - 3**

## **LOAD TIMER ADJUSTMENT**

### 1) Adjustment

- ① Fix the control lever in the position satisfying the following conditions.

Boost Pressure : — mmHg

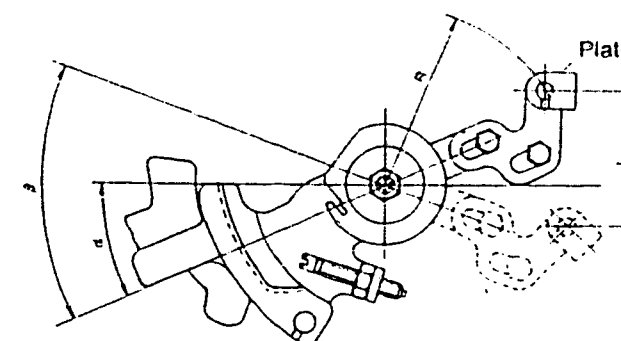
Pump Speed : 900 rpm

Fuel Injection : 16.0~18.0 cc/1000st  
Quantity

- ② With the control lever positioned as described in ① above, adjust the governor sleeve so that the timer stroke conforms to the specified values ( 2 - 7 ) .

## **Accelerator Cable Plate Installation**

Set the installation position for the plate, as shown below, according to the control lever angle (angle B) .



39° ≤ β < 41.5° ⇨ R = 64mm (The plate is in the outermost position)

41.5° ≤ β ≤ 46.5° ⇨ Adjust using R so that ℓ = 41.5 ± 0.9mm

46.5° < β ≤ 49.0° ⇨ R = 57mm (The plate is in the innermost position)

※ Measure "ℓ" parallel to the centre line of the pump.



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# ■ POTENTIOMETER ADJUSTMENT

Under the following conditions, alter the potentiometer's installation position so that the out-put voltage equals the specified value.

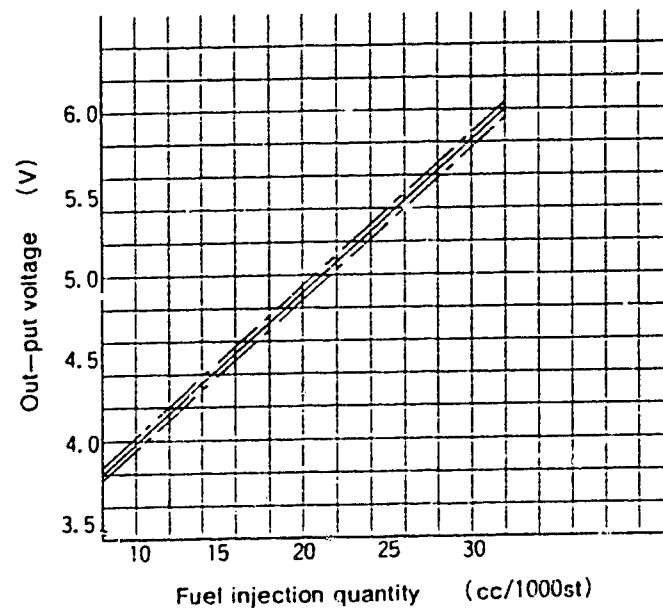
Adjustment Conditions			Specified Value	Remarks
Control lever position	Pump speed (rpm)	Fuel injection quantity(cc/1000st)	Out-put voltage (V)	
Approx 11°	600	Measure	Measure	Adjusting point
Idle	—	—	—	Check point
Full speed	—	—	—	Check point

[In-put Voltage:10V]

※ A control lever position of approximately 11°, means that a block gauge of 5.8 mm thickness is inserted between the control lever and the idling stopper bolt.

$$V = (0.0916 \cdot Q + 3.06) \pm 0.03 \text{ (V)}$$

$$14.2 \leq Q \leq 26.2$$



# ■ W—CSD Adjustment

## 1) Intermediate Lever Position Adjustment

1. Align the intermediate lever with the aligning mark.
2. Adjust the intermediate lever set screw so that the control lever and the intermediate lever set screw are in contact, and then fix in position using the locknut.

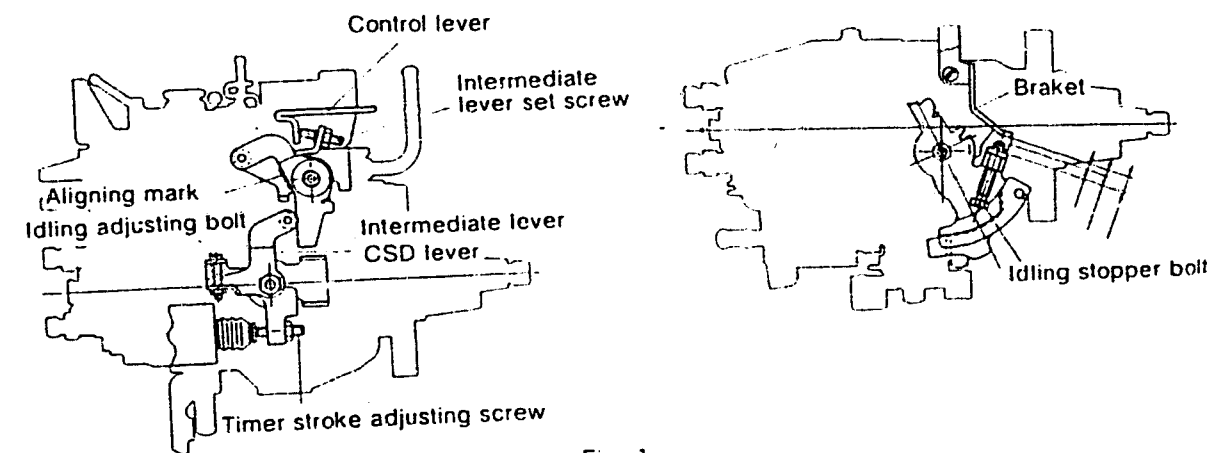


Fig. 1

## 2) Timer Stroke Adjustment (adjust to the thick line)

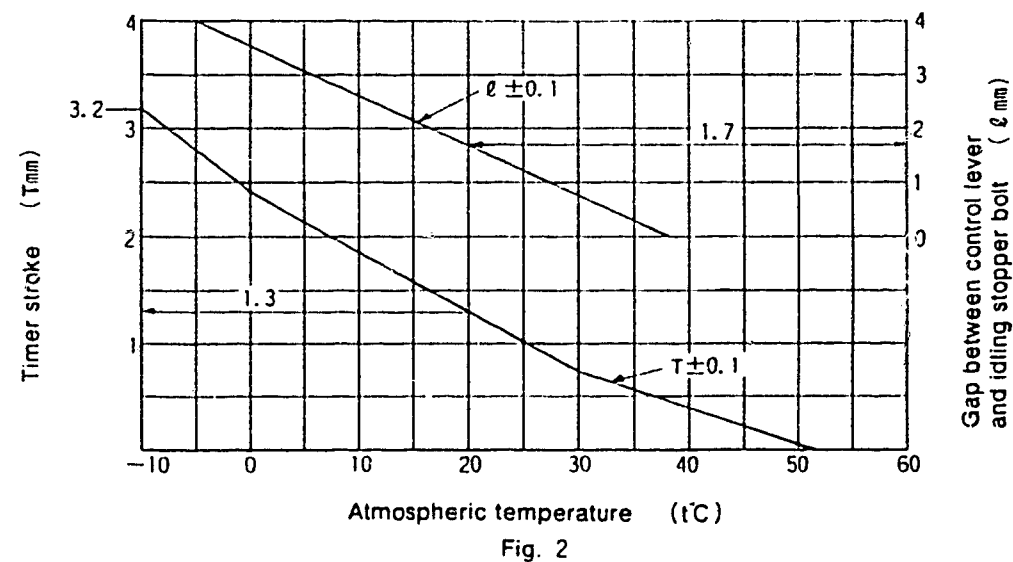
1. Calculate the timer stroke from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Adjust using the timer stroke adjusting screw so that the timer stroke is as calculated in Step 1.

## 3) CSD Lever Adjustment (adjust to the thick line)

1. Calculate the block gauge dimension  $\ell \pm 0.05\text{mm}$  from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Insert the block gauge (thickness gauge) selected in Step (1) above between the bracket and the idling stopper bolt.
3. Insert a block gauge (thickness gauge) of  $3 \pm 0.05\text{ mm}$  thickness between the control lever and the intermediate lever.
4. Using the idling bolt, adjust so that the CSD lever roller and the intermediate lever are in contact.

Formula for calculating Fig. 2

Formula for calculating timer stroke :

When  $t \leq 0$   $T = -0.080t + 2.3999$ When  $0 \leq t \leq 30$   $T = -0.05458t + 2.3999$ When  $30 < t$   $T = -0.03563t + 1.8313$ Formula for calculating control lever and idling stopper bolt gap : When  $\ell = -0.095t + 3.6$ 

# **INJ. PUMP CALIBRATION DATA** **Distributor-type**

TEST OIL:  
 ISO 4113 or  
 SAE J967d

ENGINE MODEL : 4FD1

Injection pump No.: 104649-1911 [NP-VE4/9F2250RNP220]

BOSCH No. 9 460 610 294  
 DKKC No. 104749 - 6731  
 Date : 29, Sept. 1989  
 Company : ISUZU  
 No. 894468 6020

**D - 6**

Pump rotation : clockwise-viewed from drive side

For Test Condition see  
 Microfiche No. WP-210 (N-16)  
 Spec. A

Pre-stroke : 0.25 mm

1. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
1-1	Timing device travel	1,250	3.4 ~ 3.8 (mm)		
1-2	Supply pump pressure	1,250	4.6 ~ 5.0 (kg/cm <sup>2</sup> )		
1-3	Full load delivery without charge air pressure	1,250	37.2 ~ 38.2 (cc/1,000st)		3.0
	Full load delivery with charge air pressure		(cc/1,000st)		
1-4	Idle speed regulation	340	5.5 ~ 9.5 (cc/1,000st)		2.0
1-5	Start	100	50.0 ~ 70.0 (cc/1,000st)		4.5
1-6	Full-load speed regulation	2,600	13.1 ~ 19.1 (cc/1,000st)		
1-7					
1-8					

## **2. Test Specifications**

2-1	Timing device	N = rpm mm	1,250 3.3 ~ 3.9	2,000 6.3 ~ 7.5	2,500 8.6 ~ 9.4
2-2	Supply pump	N = rpm kg/cm <sup>2</sup>	1,250 4.6 ~ 5.0	2,000 6.2 ~ 6.8	2,500 7.6 ~ 8.2
2-3	Overflow delivery	N = rpm cc/10s	1,250 55.0 ~ 98.0		

## **2-4 Fuel injection quantities**

Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)
End stop	1,250	36.7 ~ 38.7		
	600	30.7 ~ 34.7		
	2,250	33.1 ~ 37.3		
	2,600	12.6 ~ 19.6		
	2,900	Below 4.5		
Switch OFF	340	0		
Idle stop	340	5.5 ~ 9.5		
	500	0		
2-5 Solenoid	Max. cut-in voltage: 8 V Test voltage: 12 ~ 14 V			

## **3. Dimensions**

K	3.2 ~ 3.4	mm
KF	5.7 ~ 5.9	mm
MS	1.5 ~ 1.7	mm
BCS	—	mm
Control lever angle		
$\alpha$	-7.0 ~ +1.0	deg
A	8.8 ~ 11.4	mm
$\beta$	32.0 ~ 42.0	deg
B	10.2 ~ 13.5	mm
$\gamma$	—	deg
C	—	mm



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# INJ. PUMP CALIBRATION DATA

## Distributor-type

TEST OIL:  
ISO 4113 or  
SAE J967d

ENGINE MODEL : LD28

Injection pump No.: 104669 - 2122 [NP-VE6/9F2500RNP32]

BOSCH No. 9 460 610 312 1/5

DKKC No. 104769 - 2064

Date : 29, Sept. 1989

Company : NISSAN

No. 16700 50L05

**D - 7**

104769 - 2064 2/5

Pump rotation : clockwise-viewed from drive side

For Test Condition see  
Microfiche No. WP-210 (N-16)  
Spec. A

Pre-stroke : — mm

1. Setting	Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
1-1 Timing device travel	900	T = 2.0 ~ 2.6 (mm)		
1-2 Supply pump pressure	900	3.5 ~ 4.1 (kg/cm <sup>2</sup> )		
1-3 Full load delivery without charge air pressure	900	29.0 ~ 30.0 (cc/1,000st)		2.5
Full load delivery with charge air pressure		(cc/1,000st)		
1-4 Idle speed regulation	350	6.3 ~ 9.3 (cc/1,000st)		
1-5 Start	100	40.8 ~ 48.8 (cc/1,000st)		
1-6 Full-load speed regulation	2,600	15.5 ~ 21.5 (cc/1,000st)		
1-7 Load - timer adjustment	900	T = 0.5 ± 0.3 (mm)		
1-8				

## 2. Test Specifications

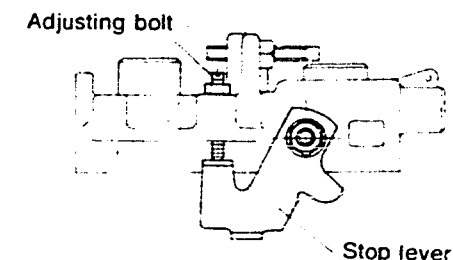
2-1 Timing device	N = rpm mm	900 1.9 ~ 2.7	1,200 3.5 ~ 4.7	2,300 8.1 ~ 9.0
2-2 Supply pump	N = rpm kg/cm <sup>2</sup>	900 3.4 ~ 4.2	1,800 5.5 ~ 6.3	2,500 7.2 ~ 8.0
2-3 Overflow delivery	N = rpm cc/10s	900 43.0 ~ 87.0		
2-4 Fuel injection quantities				
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press (mmHg)	Difference in delivery (cc)
Full speed position	900	28.5 ~ 30.5		
	600	27.0 ~ 31.0		
	2,300	28.8 ~ 32.8		
	2,600	15.0 ~ 22.0		
	2,800	Below 5.0		
Switch OFF	350	0		
Idling position	350	5.8 ~ 9.8		2.2
	500	Below 4.0		
Partial load	900	2.1 ~ 12.1		
2-5 Solenoid	Max. cut-in voltage: 8 V Test voltage: 12 ~ 14 V			

## 3. Dimensions

K	3.20 ~ 3.40	mm
KF	6.54 ~ 6.74	mm
MS	1.70 ~ 1.90	mm
BCS	—	mm
Control lever angle		
α	21.0 ~ 29.0	deg
A	5.7 ~ 9.5	mm
β	39.0 ~ 49.0	deg
B	11.0 ~ 16.0	mm
γ	10.5 ~ 11.5	deg
C	4.8 ~ 5.2	mm

## Starting Injection Quantity Adjustment

Adjust the starting injection quantity (item 1/5) using the adjusting bolt (as shown in the figure at right)



## LOAD TIMER ADJUSTMENT

### 1) Adjustment

- Fix the control lever in the position satisfying the following conditions.

Boost Pressure : — mmHg

Pump Speed : 900 rpm

Fuel Injection Quantity : 9 ± 1 cc/1000st

- With the control lever positioned as described in 1 above, adjust the governor sleeve so that the Timer Stroke conforms to the specified values (Item 1/7).



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# ■ W — CSD Adjustment

## 1) Timer stroke adjustment

1. Calculate the timer stroke from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Adjust using timer stroke adjusting screw so that the timer stroke is as calculated in Step. 1.

## 2) Intermediate lever position adjustment

1. Insert a block gauge (thickness gauge) of  $0.9 \pm 0.05$  mm thickness between the control lever and the idling stopper bolt.
2. Align the intermediate lever with the aligning mark.
3. Adjust the intermediate lever set screw so that the control lever and intermediate lever set screw are in contact, and then fix in position using the locknut.

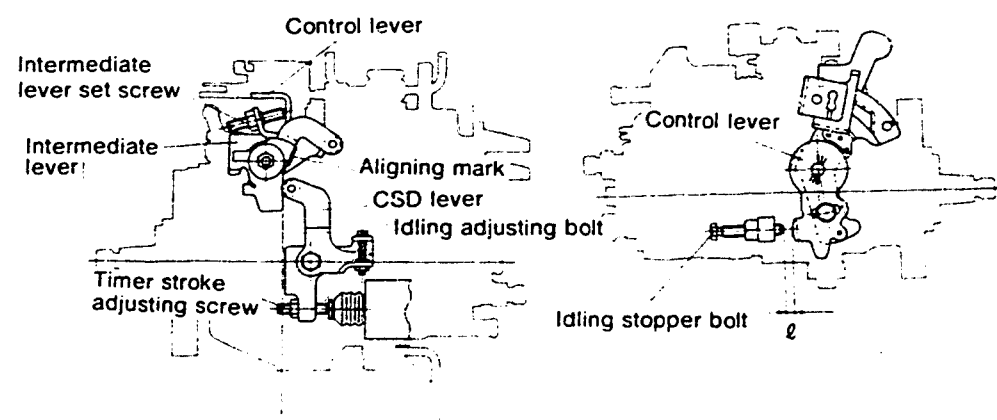


Fig. 1

## 3) CSD lever adjustment

1. Calculate the block gauge dimension  $l \pm 0.05$  mm from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Insert the block gauge (thickness gauge) between the control lever and the idling stopper bolt.
3. Using the idling bolt, adjust so that the CSD lever roller and intermediate lever are in contact.

Formula for calculating Fig. 2

Formula for calculating timer stroke:

$$\text{When } -10 \leq t \leq 20 \quad T = -0.0367 t + 1.284$$

$$\text{When } 20 \leq t \leq 40 \quad T = -0.0275 t + 1.1$$

Formula for calculating control lever and idling stopper bolt gap:

$$\text{When } -10 \leq t \leq 20 \quad l = -0.0628 t + 2.1555$$

$$\text{When } 20 \leq t \leq 30 \quad l = -0.0507 t + 1.9142$$

$$\text{When } 30 \leq t \leq 50 \quad l = -0.0196 t + 0.9809$$

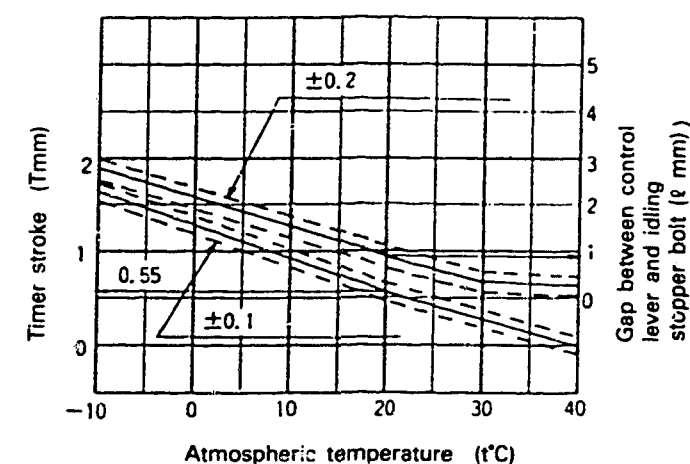


Fig. 2

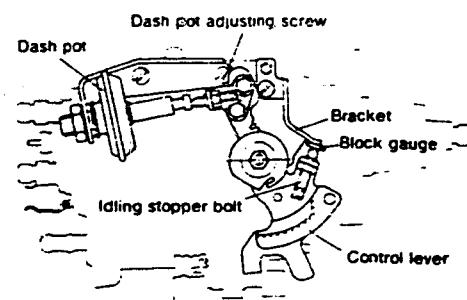


**Notes:**

1. The temperature of the wax must be below 30°C when adjusting.
2. When inserting a block gauge (thickness gauge) between the control lever (bracket) and the idling stopper bolt, use the idling adjusting bolt to separate the CSD lever and intermediate lever so that no excessive force is exerted on them.

**■ DASH POT ADJUSTMENT**

- ① Insert a block gauge (thickness gauge) of thickness  $3.4 \pm 0.05$  in the gap between the idling stopper bolt and the bracket.
- ② With the control lever positioned as described in ① above, adjust the Dashpot adjusting screw so that the Dashpot adjusting screw and the push rod are in contact. Fix using the nut.



# INJ. PUMP CALIBRATION DATA

TEST OIL:  
ISO 4113 or  
SAE J967d

Distributor—type

ENGINE MODEL : RD28

Injection pump No: 104669 — 2113 (NP—VE6/9F2500RNP40)

BOSCH No. 9 460 610 313 1/3

DKKC No. 104769 — 2115

Date : 29, Sept. 1989 [3]

Company : NISSAN

No. 16700 V7204

Pump rotation : clockwise-viewed from drive side

Pre-stroke : — mm

For Test Condition see  
Microfiche No.WP-210(N16)  
Spec. A

1. Setting	Pump speed (rpm)	Settings	Charge air press(mmHg)	Difference in delivery(cc)
1-1 Timing device travel	900	1.2 ~ 1.6 (mm)		
1-2 Supply pump pressure	900	3.5 ~ 4.1 (kg/cm <sup>2</sup> )		
1-3 Full load delivery without charge air pressure	900	30.9 ~ 31.9 (cc/1,000st)		2.5
Full load delivery with charge air pressure		(cc/1,000st)		
1-4 Idle speed regulation	350	5.8 ~ 8.8 (cc/1,000st)		
1-5 Start	100	Above 38.0 (cc/1,000st)		
1-6 Full-load speed regulation	2,600	15.5 ~ 21.5 (cc/1,000st)		
1-7				
1-8				

## 2. Test Specifications

2-1 Timing device	N = rpm	900	1,200	2,300
	mm	1.1 ~ 1.7	2.9 ~ 3.7	8.1 ~ 9.0
2-2 Supply pump	N = rpm	900	1,800	2,500
	kg/cm <sup>2</sup>	3.4 ~ 4.2	5.5 ~ 6.3	7.2 ~ 8.0
2-3 Overflow delivery	N = rpm	900		
	cc/10s	43.0 ~ 87.0		

## 2-4 Fuel deliveries

Speed control lever	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery
End stop	2,800	Below 5.0		
	2,600	15.0 ~ 22.0		
	2,300	28.0 ~ 32.0		
	900	30.4 ~ 32.4		
	600	29.1 ~ 33.1		

Switch OFF	350	0		
Idle stop	350	5.3 ~ 9.3		1.4
	500	Below 4.0		

Partial load	900	2.5 ~ 12.5		
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2-5	Max.cut-in voltage : 8 V
Solenoid	Test voltage : 12 ~ 14 V

## 3. Dimensions

K	3.2 ~ 3.4	mm
KF	6.54 ~ 6.74	mm
MS	1.7 ~ 1.9	mm
BCS	—	mm

## Control lever angle

α	19.0 ~ 27.0	deg
A	8.7 ~ 12.9	mm
β	37.0 ~ 47.0	deg
B	11.5 ~ 15.2	mm
γ	10.5 ~ 11.5	deg
C	5.7 ~ 6.3	mm

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■ W—CSD Adjustment

1) Timer Stroke Adjustment (adjust to the thick line)

1. Calculate the timer stroke from Fig. 2 according to the atmospheric temperature at the time of adjustment.
2. Adjust using the timer stroke adjusting screw so that the timer stroke is as calculated in Step 1.

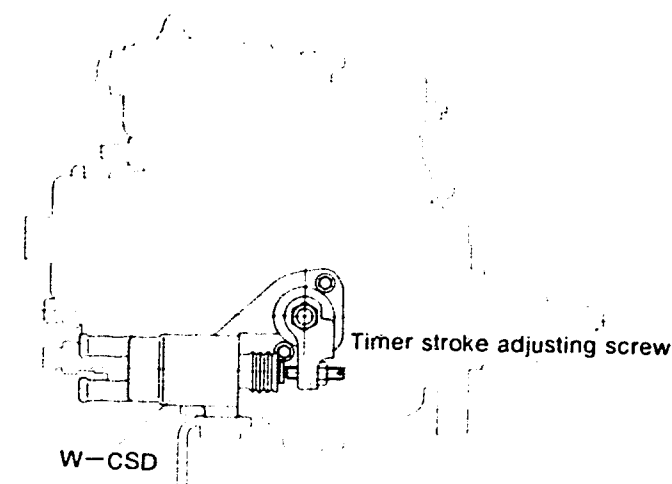


Fig. 1

Formula for calculating Fig. 2

Formula for calculating timer stroke:

When  $-10 \leq t(^{\circ}\text{C}) \leq 20$   $T = -0.0367t + 1.284$

When  $20 \leq t(^{\circ}\text{C}) \leq 40$   $T = -0.0275t + 1.1$

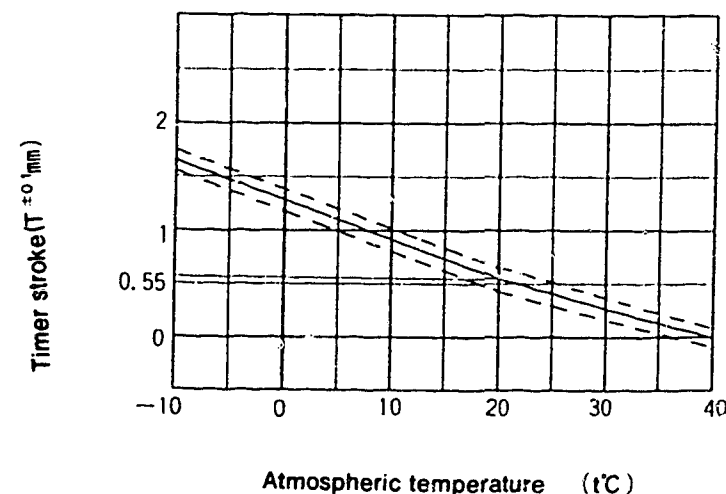
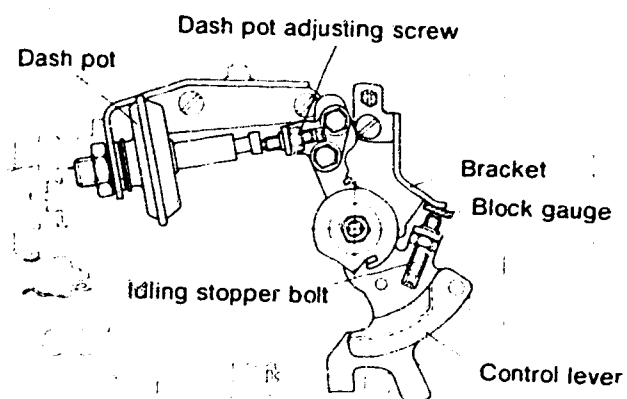


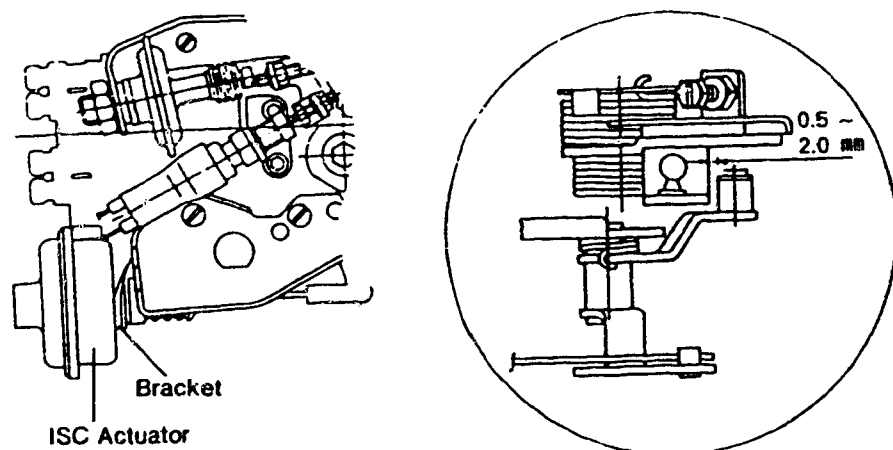
Fig. 2

**■ DASH POT ADJUSTMENT**

1. Insert a block gauge (thickness gauge) of thickness  $2.7 \pm 0.05$  mm in the gap between the idling stopper bolt and the bracket.
2. With the control lever positioned as described in ① above, adjust the dashpot adjusting screw so that the dashpot adjusting screw and the push rod are in contact. Fix the screw using the nut.

**■ ISC (Idle Speed Control) Actuator Installation**

1. Hold the control lever in the idling position.
2. Adjust the position of the actuator bracket so that the gap between the control lever and the ISC lever roller is  $0.5 \sim 2.0$  mm, and then fix the bracket in position.



# **INJ. PUMP CALIBRATION DATA** **Distributor-type**

TEST OIL:

I S O 4113 or  
S A E J967d

ENGINE MODEL : RD28T

BOSCH No. 9 460 610 368 1/4

DKKC No. 104769 — 2161

Date : 29, Sept. 1989 ⑩

Company : NISSAN

No. 16700 22J10

Injection pump No.: 104669—2161 [NP—VE6/9F2300RNP58]

Pump rotation : clockwise-viewed from drive side

Pre-stroke : — mm

For Test Condition see  
Microfiche No. WP-210 (N-16  
Spec. B)

1. Setting		Pump speed (rpm)	Settings	Charge air press (mmHg)	Difference in delivery (cc)
1—1	Timing device travel	900	1.1 ~ 1.5 (mm)	342 ~ 362	
1—2	Supply pump pressure	900	3.5 ~ 4.1 (kg/cm <sup>2</sup> )	342 ~ 362	
1—3	Full load delivery without charge air pressure	600	31.3 ~ 32.1 (cc/1,000st)	0	2.0
	Full load delivery with charge air pressure	900	38.6 ~ 39.4 (cc/1,000st)	240 ~ 260	2.0
1—4	Idle speed regulation	350	6.6 ~ 8.6 (cc/1,000st)	0	0.9
1—5	Start	100	Above 38 (cc/1,000st)	0	
1—6	Full-load speed regulation	2,350	35.3 ~ 37.3 (cc/1,000st)	470 ~ 490	4.5
1—7					
1—8					

## **2. Test Specifications**

2—1 Timing device	N = rpm mm	900 1.1 ~ 1.5	1800 4.3 ~ 5.4	2300 6.3 ~ 7.4	2500 6.5 ~ 7.4
2—2 Supply pump	N = rpm kg/cm <sup>2</sup>	900 3.5 ~ 4.1	1800 5.6 ~ 6.2	2300 6.9 ~ 7.5	
2—3 Overflow delivery	N = rpm cc/10s	900 43 ~ 87			
2—4 Fuel injection quantities					
Speed control lever position	Pump speed (rpm)	Fuel delivery (cc/1,000st)	Charge air press(mmHg)	Difference in delivery (cc)	
Full speed position	900	38.1 ~ 39.9	240 ~ 260		
	600	30.8 ~ 32.6	0		
	1,200	42.0 ~ 46.0	470 ~ 490		
	1,800	41.2 ~ 45.2	470 ~ 490		
	2,200	40.5 ~ 46.5	470 ~ 490		
	2,300	37.8 ~ 44.8	470 ~ 490		
	2,350	34.8 ~ 37.8	470 ~ 490		
	2,500	14.0 ~ 24.0	470 ~ 490		
	2,800	Below 3.0	470 ~ 490		
Switch OFF Magnet valve	350 900	0 0	0 342 ~ 362		
Idling	350 500	6.6 ~ 8.6 Below 3.0	0 0		
Partial load	900	6.6 ~ 12.6	0		
3—5 Solenoid	Max. cut-in voltage: 8 V, Test voltage: 12 ~ 14 V				

3. Dimensions		
K	3.2 ~ 3.4	mm
KF	6.54 ~ 6.74	mm
MS	1.7 ~ 1.9	mm
BCS	3.8 ~ 4.0	mm
Control lever angle		
$\alpha$	19° ~ 27°	deg
A	8.7 ~ 12.9	mm
$\beta$	37° ~ 47°	deg
B	11.5 ~ 15.2	mm
$\gamma$	10.5° ~ 11.5°	deg
C	5.7 ~ 6.3	mm

## **3. Dimensions**

K	3.2 ~ 3.4	mm
KF	6.54 ~ 6.74	mm
MS	1.7 ~ 1.9	mm
BCS	3.8 ~ 4.0	mm
Control lever angle		
α	19° ~ 27°	deg
A	8.7 ~ 12.9	mm
β	37° ~ 47°	deg
B	11.5 ~ 15.2	mm
γ	10.5° ~ 11.5°	deg
C	5.7 ~ 6.3	mm

**D - 12**

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## **POTENTIOMETER ADJUSTMENT**

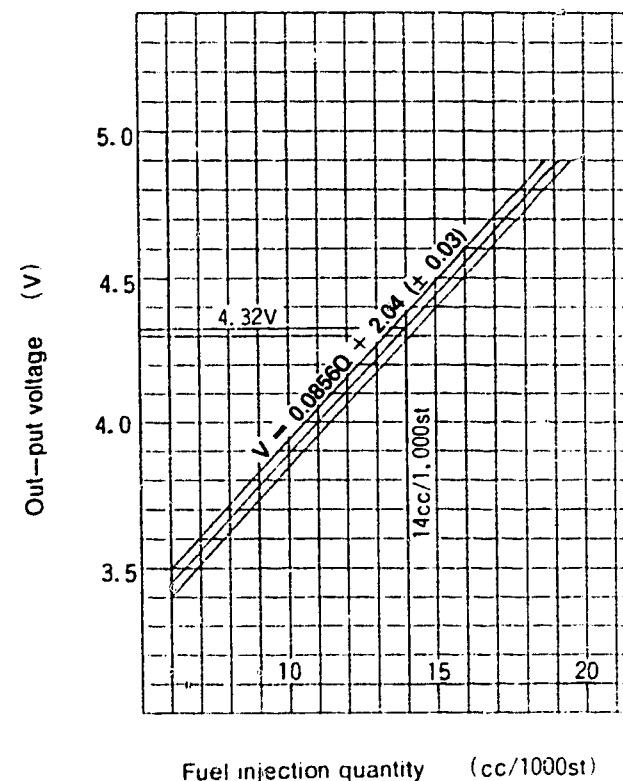
Under the following conditions, alter the potentiometer's installation position so that the out-put voltage equals the specified value.

Adjustment Conditions			Specified Value	Remarks
Control lever position	Pump speed (rpm)	Fuel injection quantity(cc/1000st)	Out-put voltage (V)	
(Approx 15.5°)	1,200	Measure	Measure	Adjusting point
Idle	—	—	—	Check point
Full speed	—	—	—	Check point

[In-put Voltage:10V]

※ A control lever position of approximately 15.5°, means that a block gauge of 8.4mm thickness is inserted between the control lever and the idling stopper bolt.

$$V \pm 0.05 = 0.1115Q + 2.7557 \text{ (V)}$$



**DIESEL KIKI CO., LTD.**  
Service Department

3-6-7 SHIBUYA, SHIBUYA-KU, TOKYO 150, JAPAN  
Tel (03) 400-1551 · Fax (03) 499-4115

## ■ M-CSD Adjustment

## 1) CSD Adjustment.

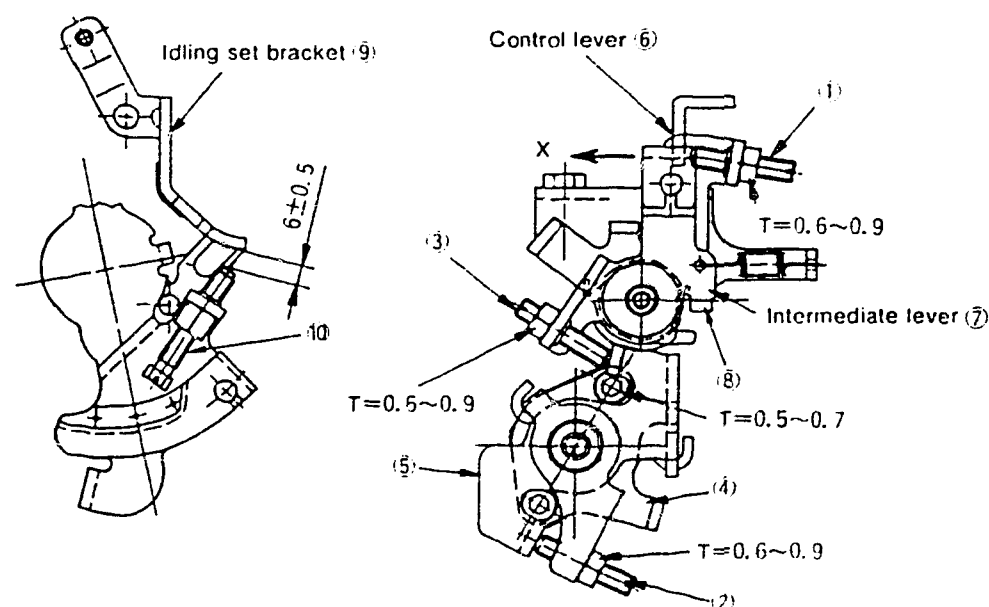
1. Hold the control lever (6) in the idling position.
2. Move the CSD lever (5) to the right until it contacts the stopper (4).
3. Then, adjust the position of the screw (2) so that the timer stroke is  $1.6 \pm 0.2$  mm and fix the screw (2) using the nut.

## 2) Fixing the Intermediate Lever Adjustment Screw

1. Hold the CSD lever (5) in the position described in item 1 (timer stroke :  $1.6 \pm 0.2$  mm).
2. Move the intermediate lever (7) toward 'X' and confirm that it contacts the stopper (8).
3. Then, adjust the screw (3) so that the CSD lever (5) contacts the screw (3) and fix the screw (3) using the nut.
4. Return the intermediate lever (7) to its original position and confirm that the timer stroke is 0 mm.

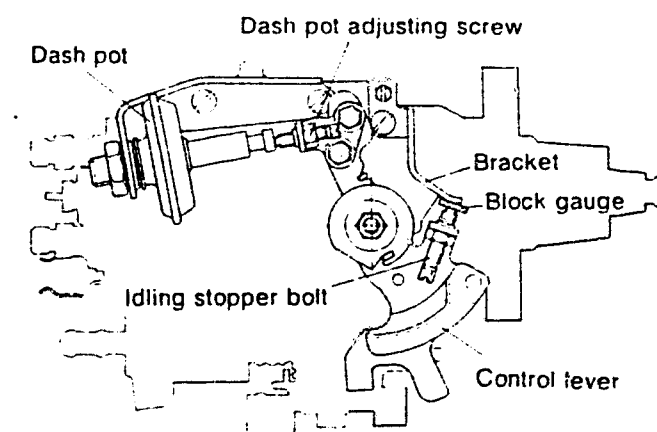
## 3) Screw (1) Adjustment

1. Move the intermediate lever (7) toward 'X' until it contacts the stopper (8).
2. Adjust the position of the screw (1) so that the gap between the idling set bracket (9) and screw (1) is  $6 \pm 0.5$  mm, and fix the screw (1) using the nut.
3. Then, confirm that the gap between the control lever (6) and screw (1) is approximately 1.7 mm.



## ■ DASH POT ADJUSTMENT

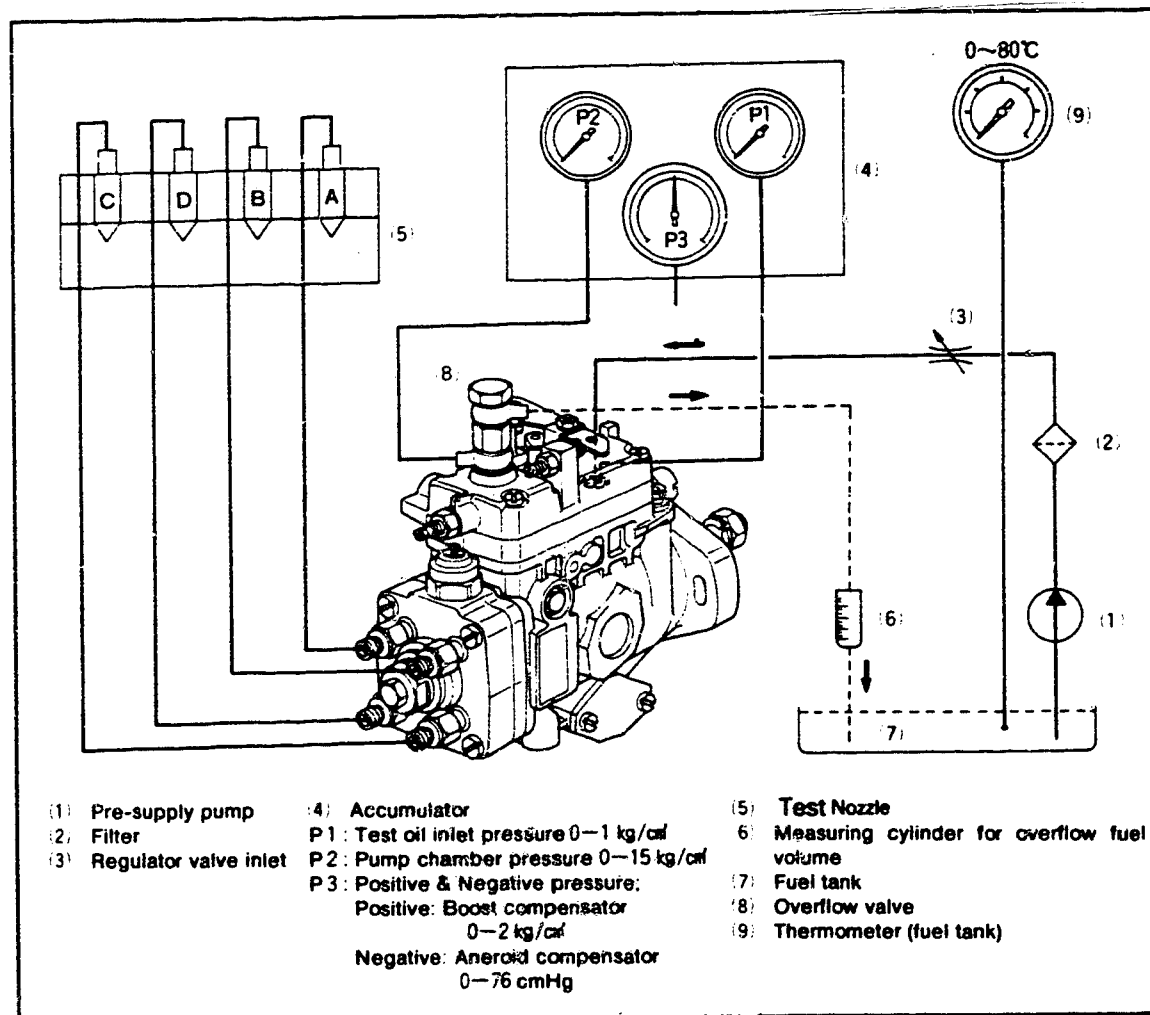
- ① Insert a block gauge (thickness gauge) of thickness  $3.8 \pm 0.05$  mm in the gap between the idling stopper bolt and the bracket.
- ② With the control lever positioned as described in ① above, adjust the dashpot adjusting screw so that the dashpot adjusting screw and the push rod are in contact. Fix the screw using the nut.



## TEST BENCH ADJUSTMENT OF VE PUMP

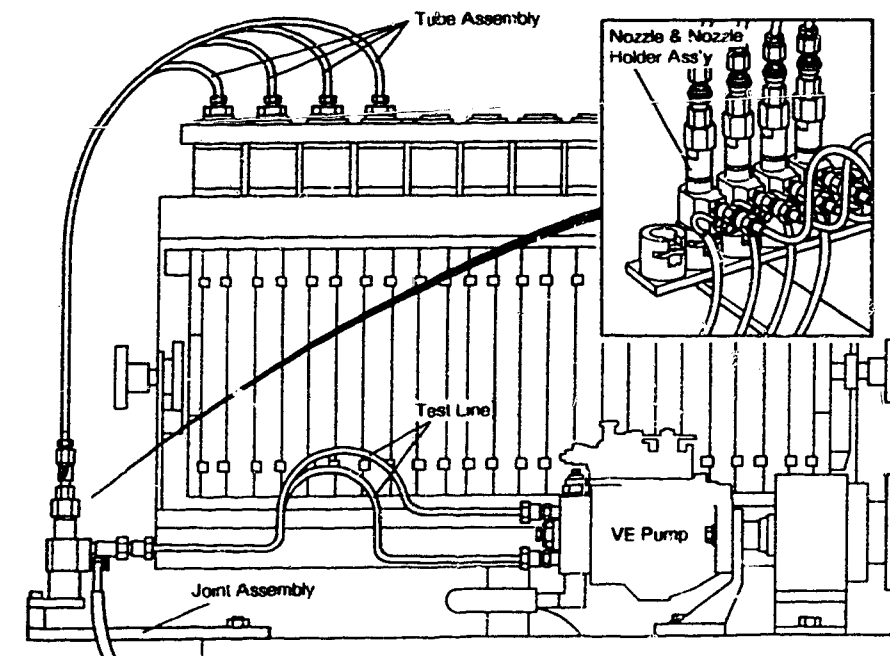
When performing VE Type Fuel Injection Pump adjustment, perform according to fuel piping diagram and adjustment conditions.

### 1. Fuel piping Diagram



### 2. Adjustment Conditions

- Test Oil : ISO 4113 or SAE standard test Oil(SAE J967d)  
Fuel oil temperature : 45<sup>±5</sup>°C  
Supply pressure : 0.2 kg/cm<sup>2</sup>  
Direction of rotation : According to respective calibration data  
\* Refer to respective calibration data for specified adjustment values.



### Test conditions

Specification	A ( Current Spec. )	B ( New Spec. )
N. & N.H. Ass'y No. Bosch No.	105780-8140 ( NP-EF8511 9A ) 0 681 343 009	105780-8190 1 688 901 022
N. Holder Ass'y No. Bosch No.	105780-2080 ( NP - EF8511 9 ) 1 688 901 013	105780-2150 —
Nozzle Ass'y No. Bosch No.	105780-0000 ( NP - DN12SD12T ) 0 681 443 014	105780-0060 ( NP - DN0SD1510 ) 1 688 901 992
Nozzle Opening Pressure ( kg cm <sup>2</sup> )	150 ± 5	133 ± 3
Test Line Part No. Bosch No.	157805-0320 φ2mm × φ6mm × 840mm M14 × 1.5 - M12 × 1.5 1 680 750 017	157805-7320 φ2mm × φ6mm × 450mm M14 × 1.5 - M12 × 1.5 1 680 750 073
Joint Ass'y No. Bosch No.	—	157641-4720 ( For 1 to 6 cylinders ) KDEP 1140
Tube Ass'y No. Bosch No.	—	157641-4020 KDEP 1140/2
Kit No. Bosch No.	—	105765-1350 KDEP 1140

Table of Contents (DKKC No. → BOSCH No.)

**N - 16**

Table of Contents (BOSCH No. → DKKC No.)

DKKC No.	BOSCH No.	Location	DKKC No.	BOSCH No.	Location
101342-0250	9 400 610 091	WP-219 B- 1 ~ B- 2			
101422-0081	9 400 610 088	WP-219 B- 3 ~ B- 4			
101451-9251	9 400 610 096	WP-219 B- 5 ~ B- 6			
101602-4652	9 400 610 097	WP-219 B- 7 ~ B- 9			
101603-6011	9 400 610 093	WP-219 B-10 ~ B-12			
101606-1572	9 400 610 095	WP-219 B-13 ~ B-14			
101672-2492	9 400 610 098	WP-219 B-15 ~ B-16			
104135-1000	9 443 610 061	WP-219 C- 1			
104294-3120	9 443 610 070	WP-219 C- 2			
104294-4000	9 443 610 080	WP-219 C- 3			
104294-4011	9 443 610 055	WP-219 C- 4			
104296-3010	9 443 610 081	WP-219 C- 5			
104303-3340	9 400 610 089	WP-219 C- 6 ~ C- 7			
104740-3663	9 460 610 372	WP-219 C- 8 ~ C- 9			
104741-1353	9 460 610 317	WP-219 C-10			
104742-7001	9 460 610 362	WP-219 C-11			
104742-7010	9 460 610 363	WP-219 C-12			
104742-7020	9 460 610 364	WP-219 C-13			
104742-7030	9 460 610 365	WP-219 C-14			
104748-0223	9 460 610 359	WP-219 C-15 ~ C-16			
104749-2242	9 460 610 393	WP-219 D- 1 ~ D- 2			
104749-2330	9 460 610 370	WP-219 D- 3 ~ D- 5			
104749-6731	9 460 610 294	WP-219 D- 6			
104769-2064	9 460 610 312	WP-219 D- 7 ~ D- 9			
104769-2115	9 460 610 313	WP-219 D-10 ~ D-11			
104769-2161	9 460 610 368	WP-219 D-12 ~ D-13			

BOSCH No.	DKKC No.	Location	BOSCH No.	DKKC No.	Location
9 400 610 088	101422-0081	WP-219 B- 3 ~ B- 4			
9 400 610 089	104303-3340	WP-219 C- 6 ~ C- 7			
9 400 610 091	101342-0250	WP-219 B- 1 ~ B- 2			
9 400 610 093	101603-6011	WP-219 B-10 ~ B-12			
9 400 610 095	101606-1572	WP-219 B-13 ~ B-14			
9 400 610 096	101451-9251	WP-219 B- 5 ~ B- 6			
9 400 610 097	101602-4652	WP-219 B- 7 ~ B- 9			
9 400 610 098	101672-2492	WP-219 B-15 ~ B-16			
9 443 610 055	104294-4011	WP-219 C- 4			
9 443 610 061	104135-1000	WP-219 C- 1			
9 443 610 070	104294-3120	WP-219 C- 2			
9 443 610 080	104294-4000	WP-219 C- 3			
9 443 610 081	104296-3010	WP-219 C- 5			
9 460 610 294	104749-6731	WP-219 D- 6			
9 460 610 312	104769-2064	WP-219 D- 7 ~ D- 9			
9 460 610 313	104769-2115	WP-219 D-10 ~ D-11			
9 460 610 317	104741-1353	WP-219 C-10			
9 460 610 359	104748-0223	WP-219 C-15 ~ C-16			
9 460 610 362	104742-7001	WP-219 C-11			
9 460 610 363	104742-7010	WP-219 C-12			
9 460 610 364	104742-7020	WP-219 C-13			
9 460 610 365	104742-7030	WP-219 C-14			
9 460 610 368	104769-2161	WP-219 D-12 ~ D-13			
9 460 610 370	104749-2330	WP-219 D- 3 ~ D- 5			
9 460 610 372	104740-3663	WP-219 C- 8 ~ C- 9			
9 460 610 393	104749-2242	WP-219 D- 1 ~ D- 2			